CONTENTS

PART 00

INTRO

HERE ON

1_Observation, Interpretation, Reproduction

shape

· Structure
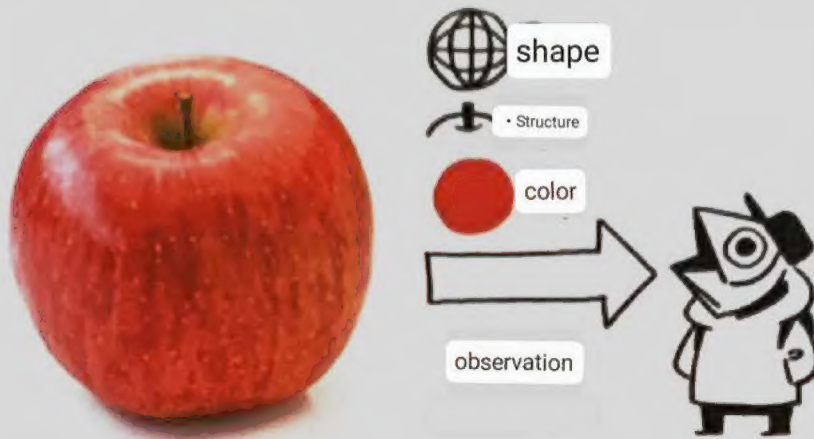
color

observation

We acquire visual information through observation. Everything visible to the eye, such as the shape, structure, color, and material of an object, becomes visual information. The more you repeat your observations, the more information you get.

interpretation

What color is it originally?

in other lighting?

How is the material?

Are there any other features?

Need more info!!

Hmm ...
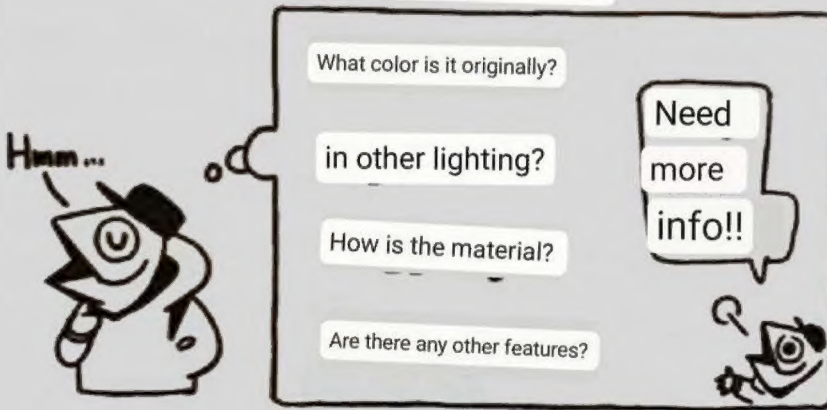
Information obtained from the subject is interpreted in the head. Information is simplified as soon as it is remembered, and the simplified information is encoded and stored. (Ex. Apples are red.) The more visual information you have, the more detailed you can remember.

□ Ability

19 tools

⑤ time

reappearance

technology

HP health

Visually reproduce visual information. There are various methods of reproduction, such as drawing and modeling. Reproduction requires sufficient preparations including information, and the subjectivity of the creator is sometimes added.

apple (language)
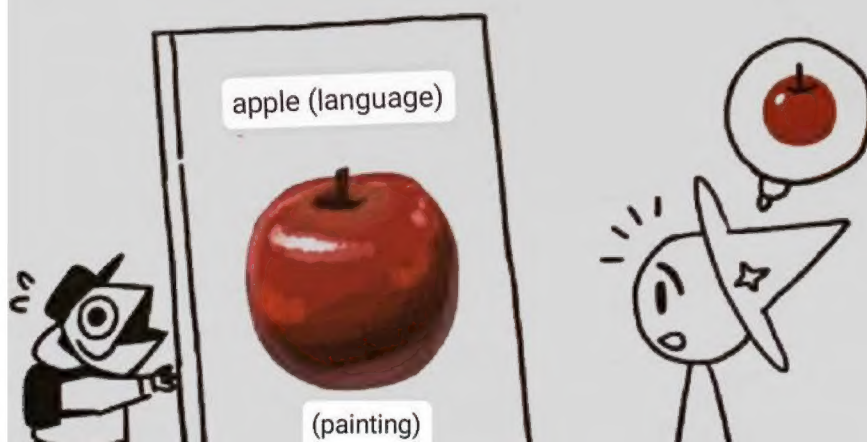
(painting)

What is completed through this is called a painting, and the painting conveys information to other observers. A picture with accurate information well reproduced becomes a more powerful means of communication than language.

2_ Symbolizing light and color

Unlike form, structure, and shape, color is a subjective sensation felt by the observer, so it often creates optical illusions.

For example, the information that an apple is red is very subjective and

fragmentary. However, in practice, apples rarely have a pure red color, and the red color of apples is only used as a kind of symbolic information.
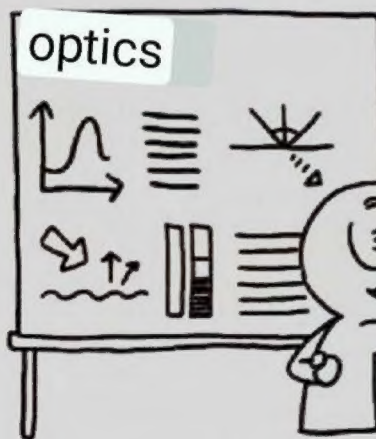
In order to create realistic colors, it is necessary to understand the light that makes the colors appear.

Since light is a physical concept, it is difficult to observe intuitively, but the principle of light making color is very important knowledge.
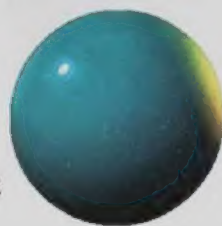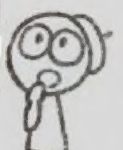
However, since color acts as a language for communication, it can be attractive enough even if it is not an objective and accurate

color. Therefore, based on accurate color by light, beautiful colors can be expressed when the creator's subjective coloring is combined.

3_ Artists who studied light and color

You have to reproduce the

expression of the facts and the

beautiful composition!

with reason!

'Ingres

neoclassicism

The instantaneous and

one-time impressions acquired by the

painter must be realized on the canvas!

With emotion

and intuition!

Monet
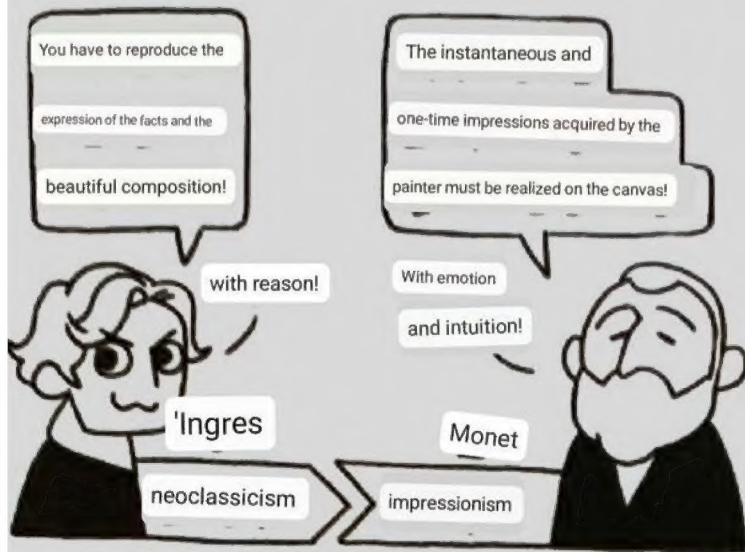
impressionism

-Claude Monet (Impression, Sunrise), 1872, oil painting

The philosophies and ways in which painters deal with color have changed and diversified over a very long time.

Classical painters tried to express the ideas of Enlightenment at the time pictorially, and they portrayed the expression of vitality and realism in a

dramatic way. On the other hand, Impressionist painters expressed their intuitive impressions, which became the roots of modern art through subjectivity and relativity.

Edvard Munch, The Sick Girl, 1886. Oil painting

• External description?

It is possible to express emotions

without having to be faithful to reality!

Hear

my message!

Munch

then

You can express your spirit

with just the 'color side'~

without

any language

Rothko

expressionism abstract expressionism
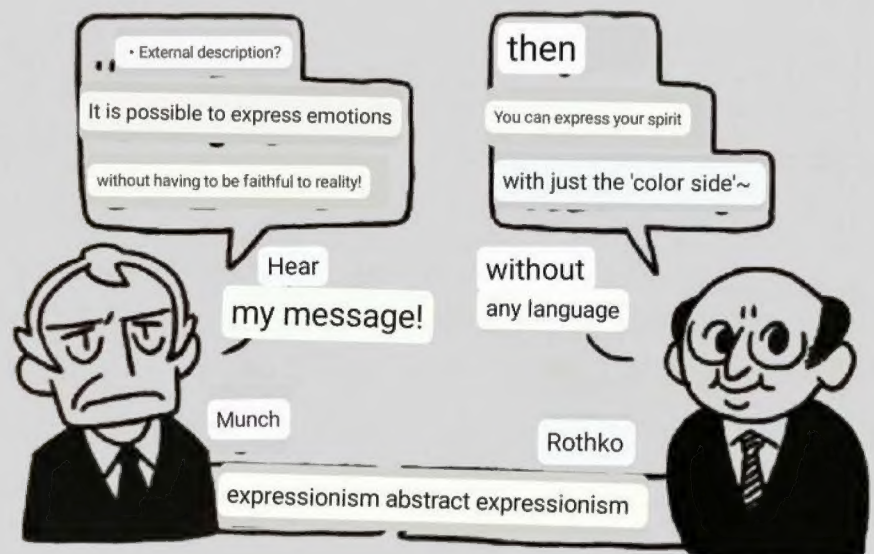
With the arrival of great art, the subject of expression became more diverse, and color as the purpose of reinterpretation remained as one

option. Through Expressionism, which tried to express excitement with intense colors and despair with gloomy colors, the subjectivity of color

was further emphasized. It is recommended that you think of light and color as one material in coloring, and think about what and how to color.

It's not all about coloring well.

4_What kind of color should I use?

A style that can be expressed with limited materials!!

The material is virtually unlimited...

how do I paint it?
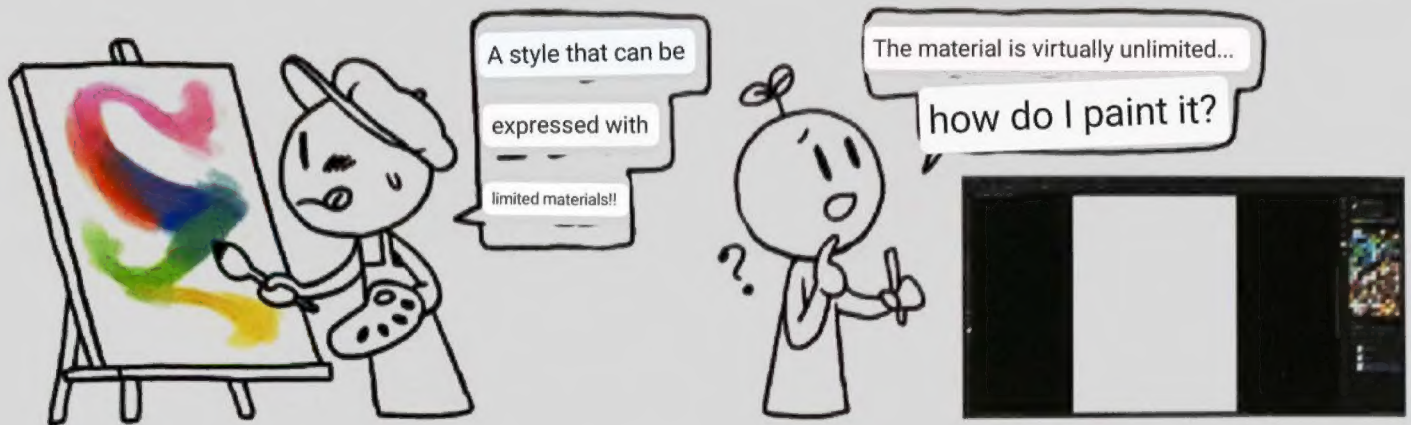
Compared to painting, the digital coloring method is very free in choosing and mixing colors. The coloring methods and styles are so diverse that it is impossible to distinguish them. Which coloring method should we use?

Wouldn't it be easier and easier to color?

It will be the most fun to brush by yourself!

Interested in realistic representation?

you,

Do you know light and photoshop?)

What is <what?

watercolor

glazing

rendering
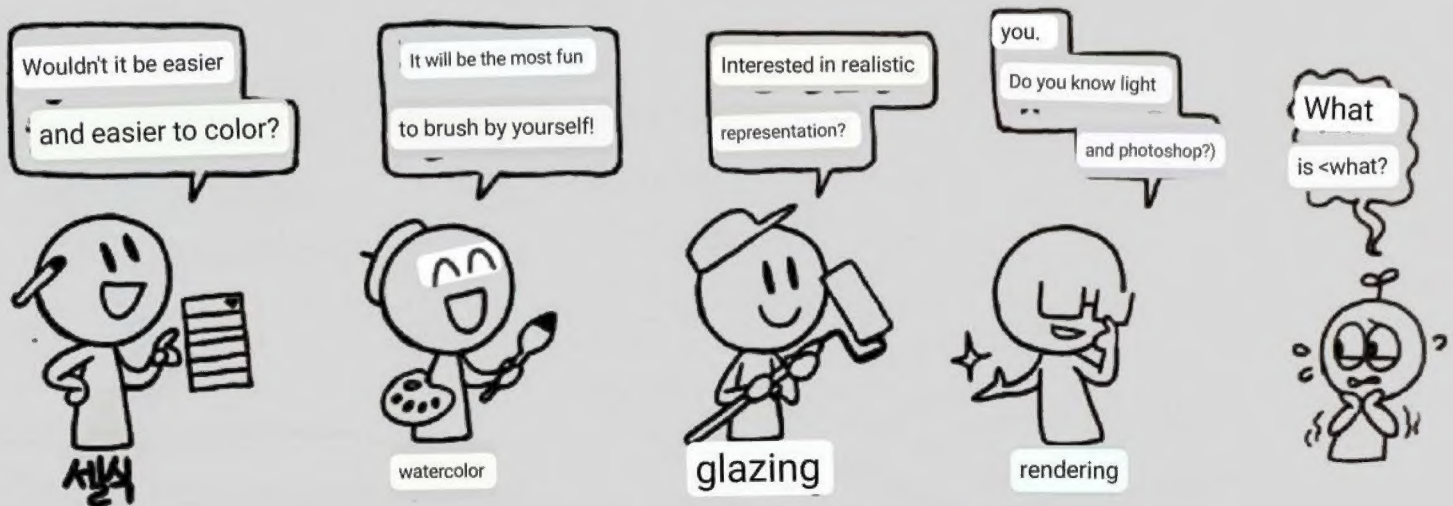
Aside from the way you color, you need to think about what and how you want to express it. How the picture will appear, such as simple and bright feeling, realistic and deep expression, is determined by subjective preference. Each coloring method has a favorable atmosphere to express, but it is also impossible to define it as a formula.

Red is red...) 'Or... blue...?

Light as light, color as color...

[Let's paint freely!

choice

There are many!!!!
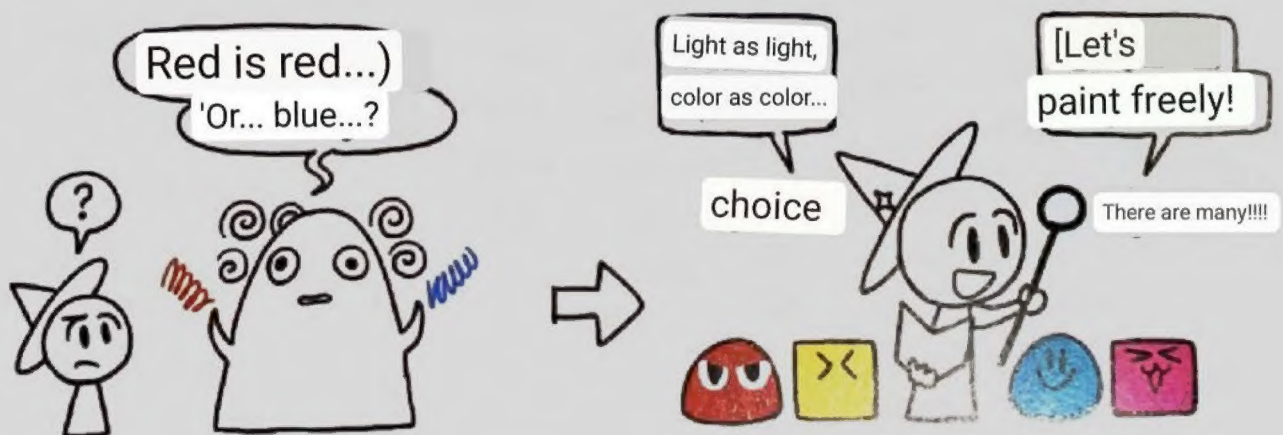
However, basic understanding of light and color is essential when painting, so in this book, we will look at various concepts necessary for coloring.

Reference as needed

PART 01

What are light and color?
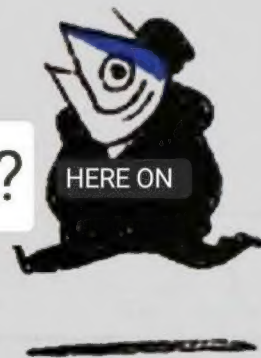
HERE ON

1_Light

1. What is light?

Among the many energies that exist in the world, the energy that illuminates the world we live in is called light.

Objects with strong energy, such as hot objects, emit light (visible light) and other electromagnetic waves.

KE

E

E

atom

E

Energy
(heat, electromagnetic wave)

AND

recognize!!

(oh!

I felt something!

There has been a change in your consciousness by an external physical stimulus~(?)
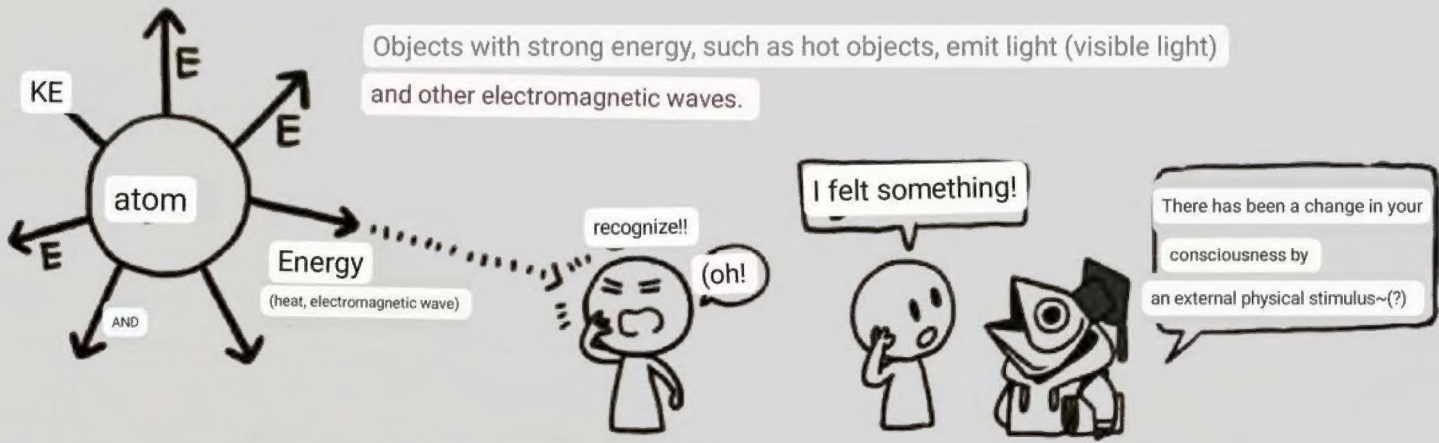
TMI♥ What are electromagnetic waves? (also called radio waves or electromagnetic waves)

In physics, the ability to do work is called energy, and electromagnetic waves are energy radiated by electromagnetic processes.

If you think of it as a game, it's a concept like "mana"!!
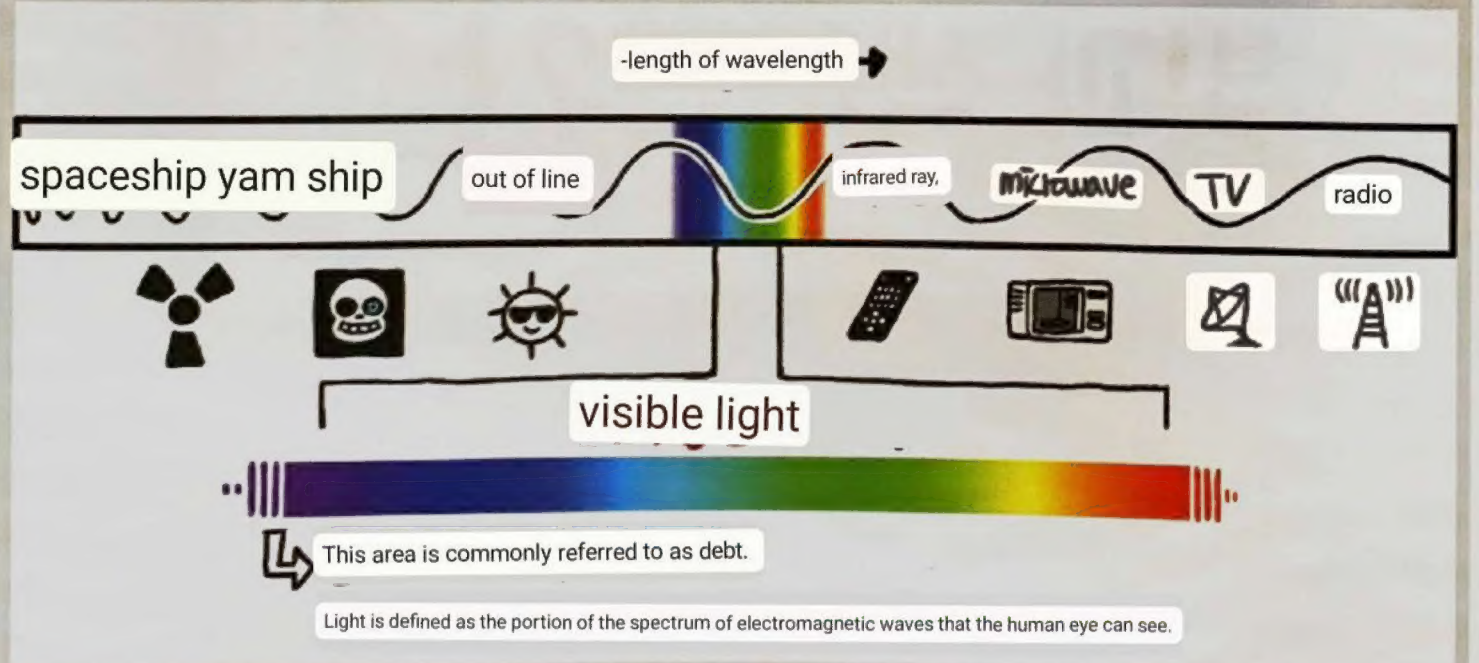
-length of wavelength

spaceship yam ship | out of line | infrared ray, | microwave | TV | radio

visible light

This area is commonly referred to as debt.

Light is defined as the portion of the spectrum of electromagnetic waves that the human eye can see.

12345

Electromagnetic waves are classified based on their wavelength.

The energy that light can have is stronger as the wavelength is shorter.

► Is light a particle or a wave?

Because there is no medium in the universe [energy cannot be transmitted through waves!

If you look at the 'double slit experiment', does light exhibit wave properties?
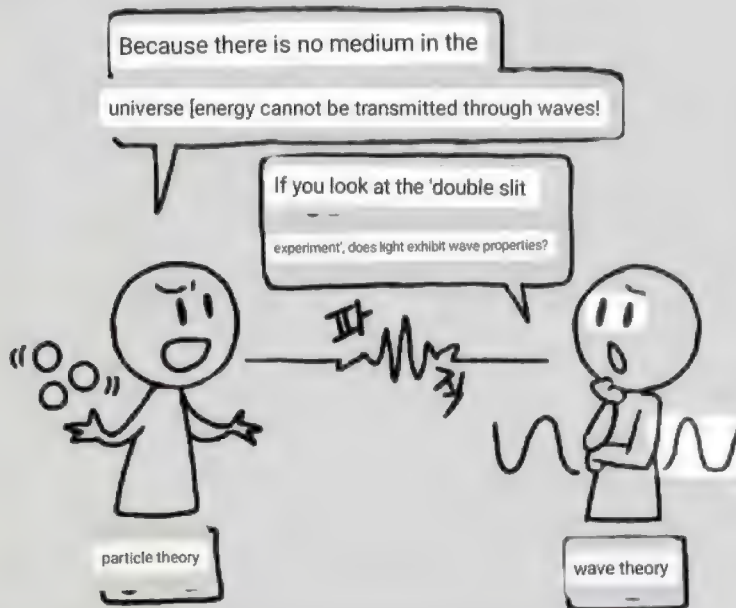
Photoelectric Effect Episode 2 The double slit experiment was controversial about the nature of light, but Einstein proved the duality of light.

particle theory

wave theory
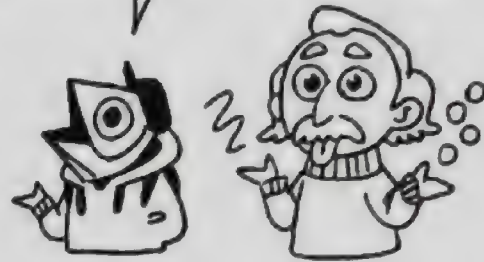
Light has both particle and wave properties. Painters who deal with color have no problem in coloring objects even if they understand light as particles.

Why does red look red?

Take a look!

particle theory
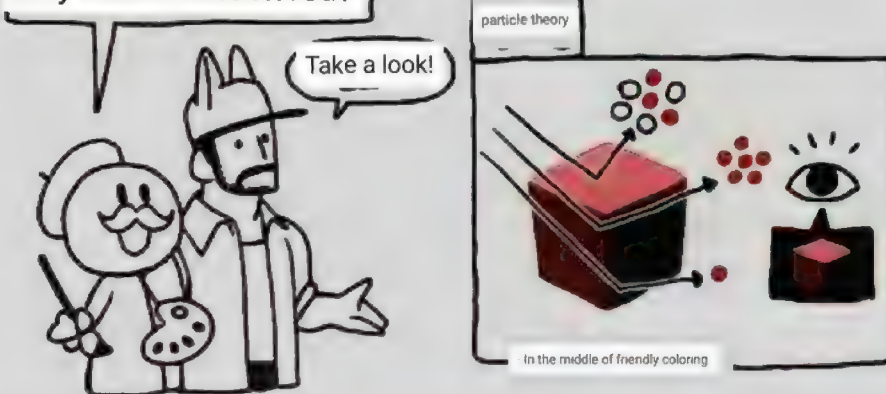
It is easy to understand if the phenomenon representing the 'color' of an object, such as reflection and absorption, is interpreted as photon'. (Actually, even if it is absorption/reflection of wavelengths...!

In the middle of friendly coloring

When coloring a character, 7 is enough! /
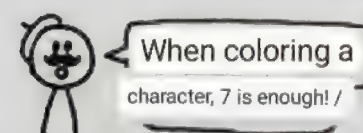
But why is the sky blue and why is the sunset burning?

However, in order to understand and express all the various colors of nature, it is useful to know that light is energy with wave properties.

help!!

The answer to the key question is 48pl!)
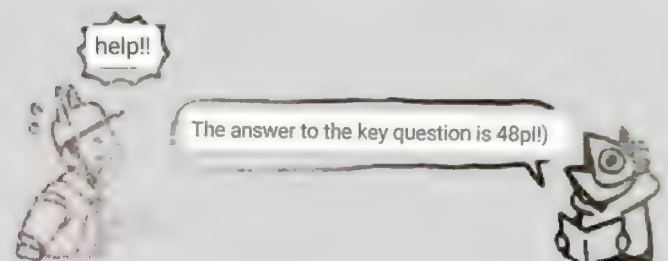
1) Double slit experiment: When a test subject is passed through a double slit and has the properties of a mass wave that distinguishes wave and particle properties, an interference pattern appears on the rear screen. 2)

Photoelectric effect: A phenomenon in which a substance (particle) such as a metal emits electrons when exposed to light

2. Additive mixing with the three primary colors of light

We are irreplaceable!

(Shall we make a pink (M) debt?

Ha ha ha

The three independent colors of pure light (red, green, and blue) are called the three primary colors

of light. By properly controlling these three colors of light, we can create any color of light we can see.

It's !

a hot addition mix!!

dream

A.. got stronger!!

Here, the green light

(G) is also added..?!
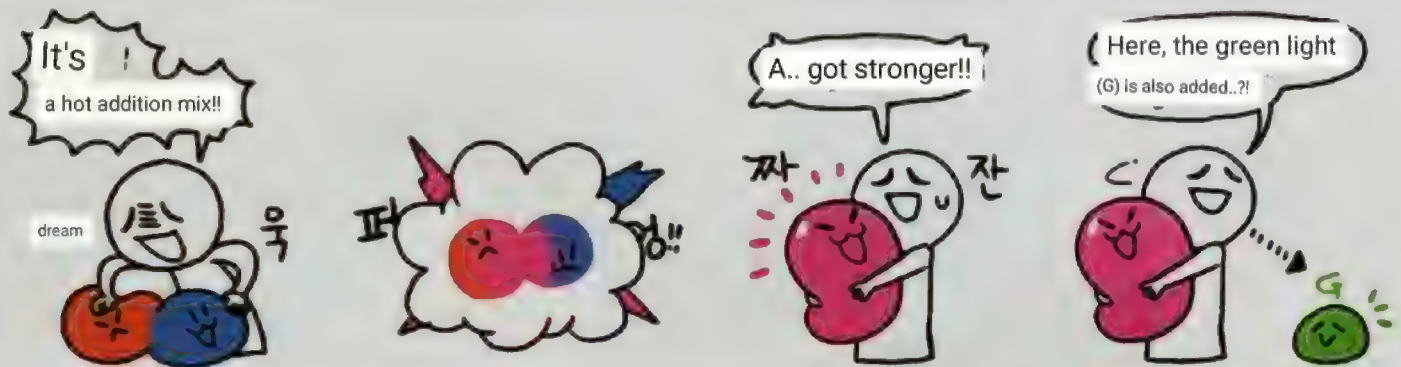
As the light of different colors is added, the intensity of the light that enters the eye becomes stronger and brighter.

The mixing process of light is called additive mixing by using '加)', which means to add.

Since light is energy, additive mixing takes

place, and the more pigments such as paints are

mixed, the darker it gets.

Be careful!
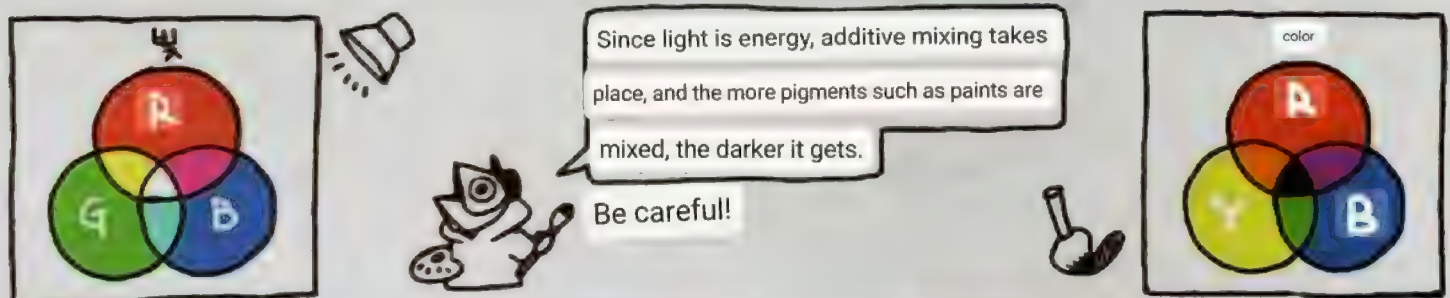
color

TMI In general, a particular color of light actually has several wavelengths.

blue

strength

Length of Wavelength (Color)

Even the same white light can

appear different colors depending

on the distribution of wavelengths

just

know

red traffic light

laser pointer
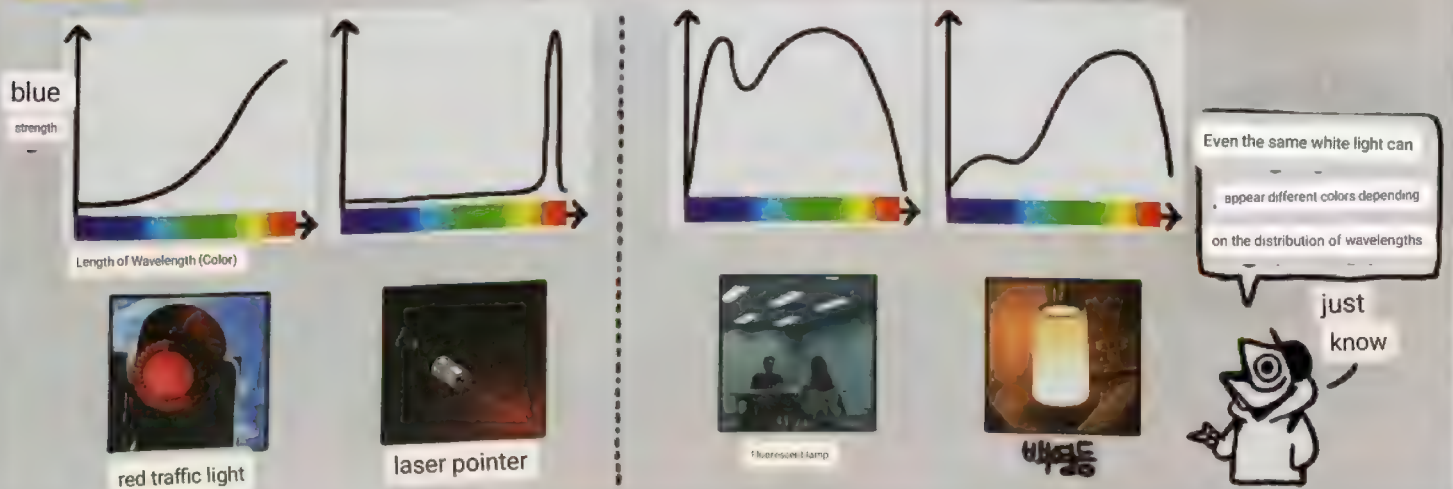
3. Until light is perceived as a color

Different colors of light, visible light, take on different colors depending on the length of the wavelength

So, how can our eyes distinguish the difference in wavelengths into different colors?

1

I'm in love with it~!!

빛

(((

-pupil (entrance)

-Iris (door)
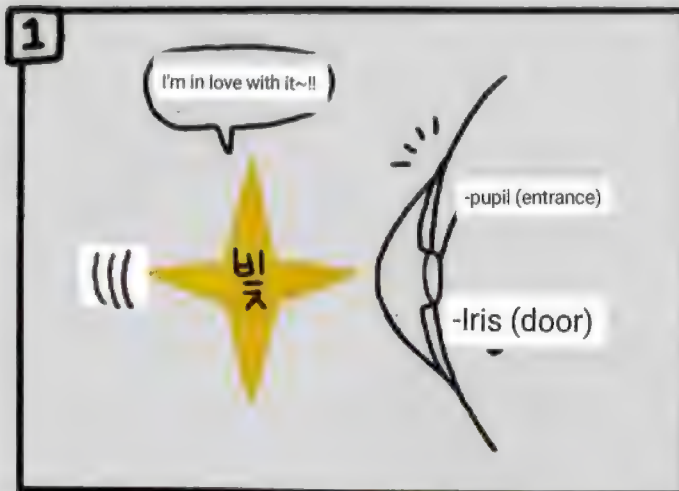
When light reaches our eyes, it travels through the pupil to the optic nerve.

2

retina   Ah~!!)

knock knock

zzz

zz

Rods (about 150 million)
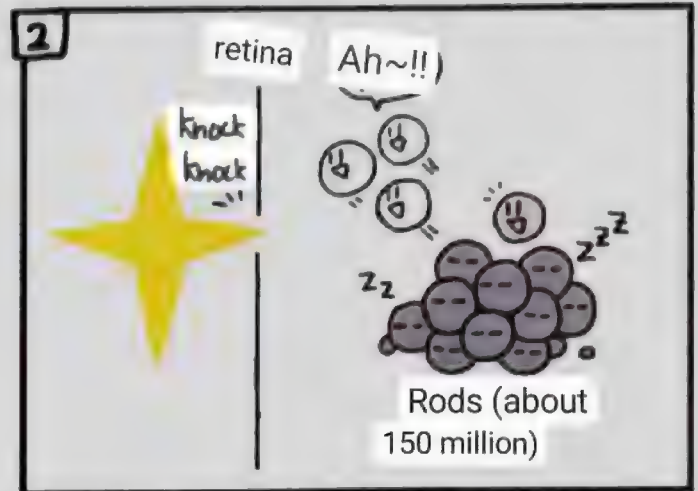
Upon reaching the retina, it excites rods and

cones. Rods detect light intensity (contrast)

3

L   M   S

abstract (cone)
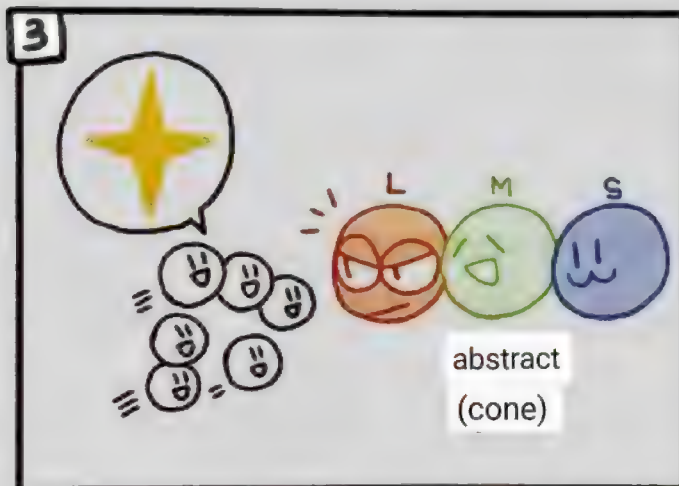
When the rods detect enough light, the cones discriminate the color.

4 2)

· Arrival

착

Each cone is activated by the wavelength of the light.

5
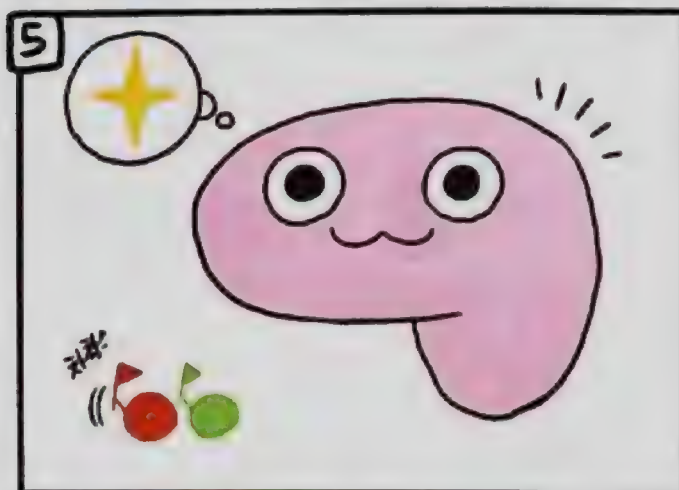
The brain perceives the finally arrived information as a color.

In other words, color is a synthesized subjective sense that the brain feels

Be aware!

1) The rods must be sufficiently active

for the cones to discriminate colors well.

Therefore, it is difficult to distinguish colors well in

dark places. 2) In this case, we assume pure yellow light.

2_Color

1. What is color?

- Principle of color appearance

"Visible light

reflect!

Light source

NEW!!
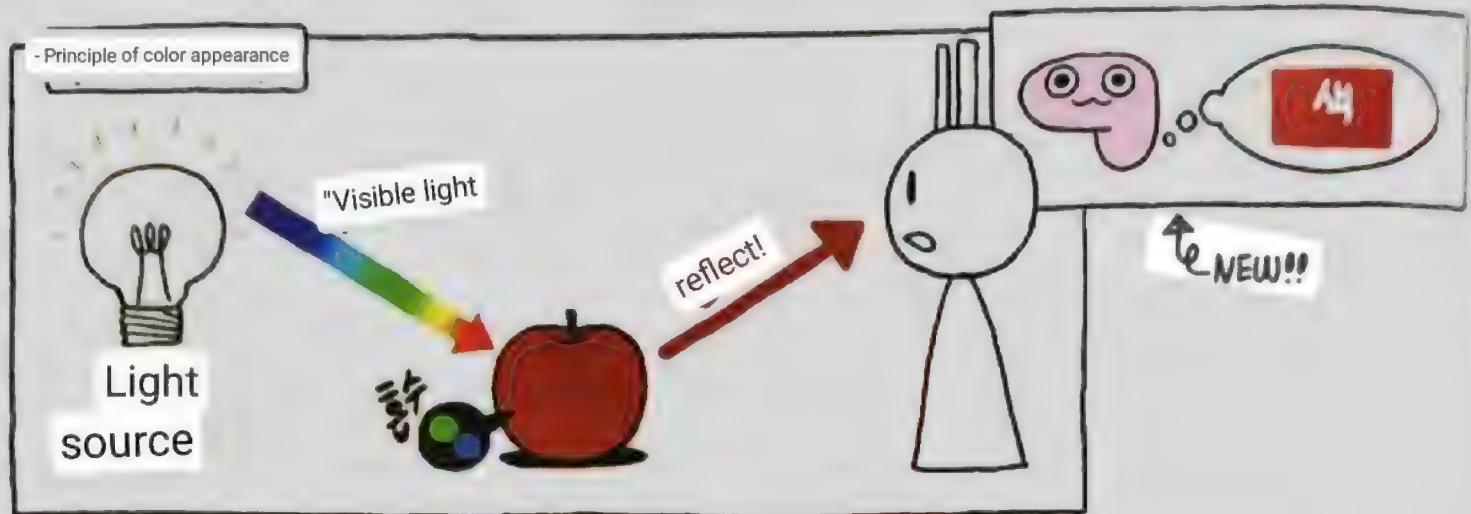
- As a dictionary definition, color refers to visual elements such as the contrast or color tone of objects that appear through light absorption and reflection

In addition, the following errors can be fixed if you understand and come across the light before.

► Is color a unique element of an object?

Apples have a red color! (×)

The apple itself is colorless, and how light reflects off the surface determines the color of the apple.

A lot of times it just looks red!
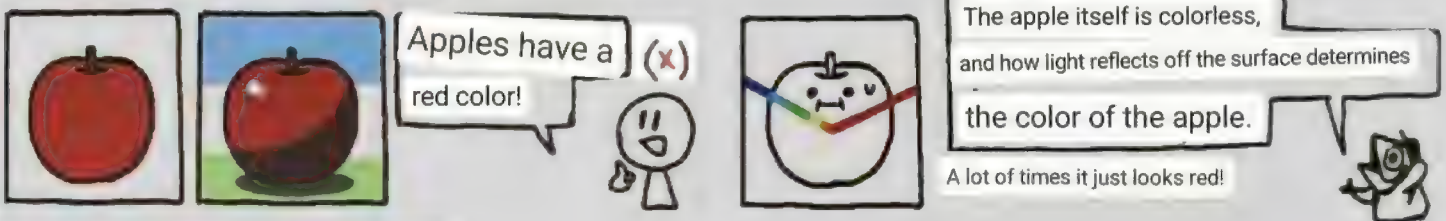
► Is it an objective thing that actually exists?

The sky is originally blue, but it looks dark because of the lack of light!! (X)

Likewise, the sky itself has no color. When we perceive it, we only judge it to be blue, and there are times when it appears as a different color depending on subjective factors.

Occasionally, it will appear in a new color!
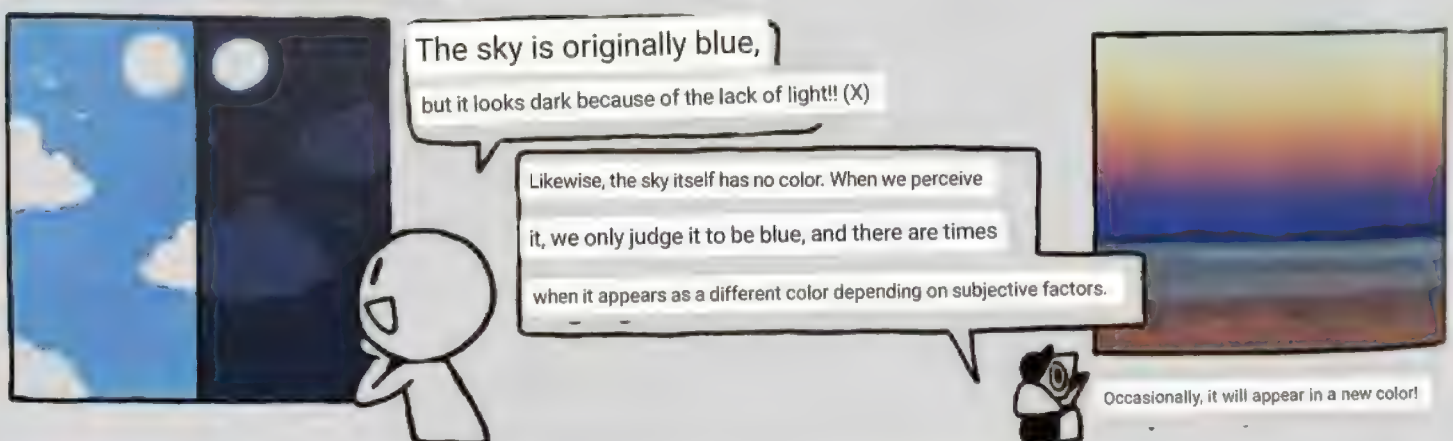
Color is not a property of an object, but a subjective sense that can be perceived differently by the visual organ depending on the light conditions

This is sweet and this is written

It's red and 'This is blue!!

Color is a synthetic sense that the eyes and brain feel, such as taste or smell, and is a subjective thing that can vary from case to case.
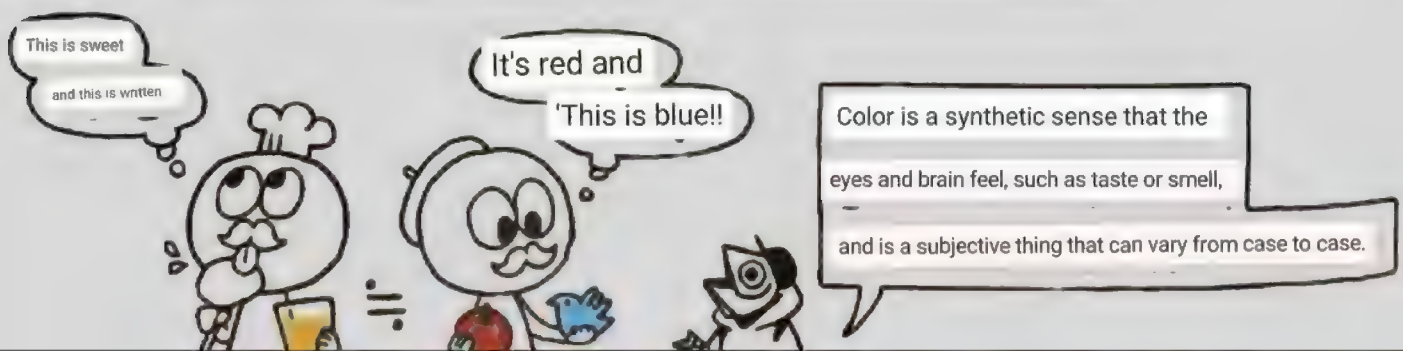
2. The three primary colors and their three properties

We are irreplaceable!

hot ha!!!

<Mixed production!!/

Why doesn't it get brighter?!

Like the three primary colors of light, there are three pure colors that are independent of each other. These are called the three primary colors of color. The three primary colors of colors can also be combined to create all colors, but because subtractive mixing is done, it gets darker and darker

light combination table

color scheme

You should watch this - - - when making subtractive mixing!

Then pink. "How to make...?"

AND
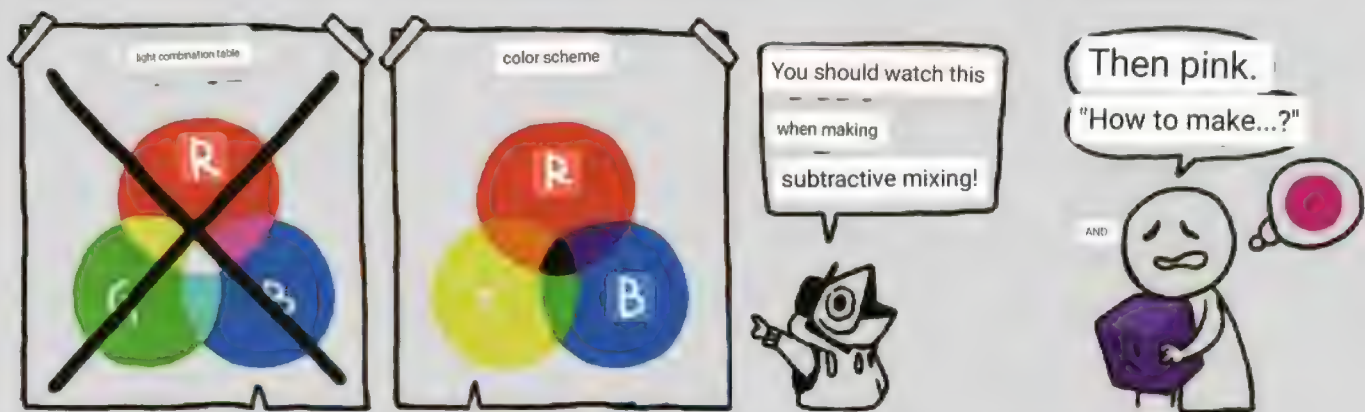
All 'hues' can be created by combining the three primary colors of colors, but not all colors can be created with color alone. Each color has three properties: Hue, Saturation, and Brightness, Value. Therefore, to create a desired color, you need to know the hue, saturation, and lightness of that color.

Hue

sup   I love this pink color!)

Saturation

It's steamy. I like it.

Brightness

W, is it light pink?

Rather than memorizing the name of the color, it is better to adjust the three main properties of the color)

2-1. Hue

[Nice to meet you, boy!

I call it the color wheel!!

The names of colors, such as red and blue, are usually used to refer to the value of the color among the properties of the color. It is often called together with words that describe lightness and saturation, such as bright yellow or vivid red. Some colors have different names depending on their saturation or brightness (ex brown = dark orange)

You can't see pink on the color wheel?!

"I" is a **bright** red one!!

This is because the same hue (hue) is sometimes called a color with a different name depending on the saturation and brightness, which will be explored later.

These are the colors that can be seen in wavelengths of light!

You can see almost any color!

The concept of integrating lightness and saturation into a color is called a tone.

2-2. Saturation

I have more red color (Hue) Saturated!!

It is said that the more vivid and pure the color of a color, the more saturated it is. The more opaque the hue of a color is, the less saturated it is, and thus the saturation is relative. Black, gray, and white where no color appears at all are said to be achromatic.

I... the saturation is a bit low...

Saturation is relative, so don't worry. ~

This content is very important to us!

There is a limit to the expression of saturation!

We call it achromatic ♡

2-3. Brightness, Value

① Brightness

Brightness is a property that distinguishes the lightness and darkness of a specific color

The brighter the light, the closer the color is to white, and the darker it is, the closer it is to black.

Light is the energy that makes an object bright.

The more the color is affected by light, the higher the brightness

If the light intensity is not appropriate, the color saturation will be rather low...

The brightness. The saturation is not enough.

2-4. Value

When we talk about brightness in color, we sometimes refer to a separate concept called Value. This is because

even colors with the same saturation and brightness values in the hue table may look different depending on the color.

We all have the same brightness and saturation! Saturation lowered
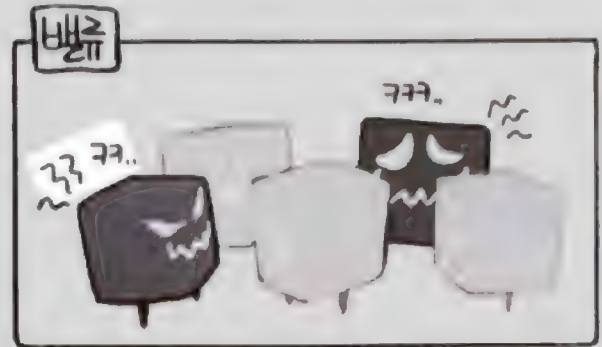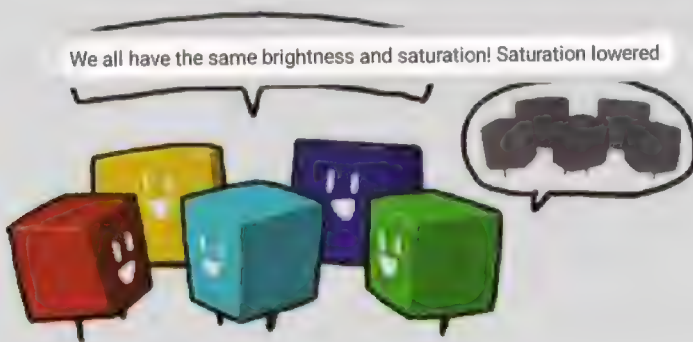
When you want to quantify the brightness of a color, you can look at the final brightness of a color that appears according to the 3 properties of a color (hue, saturation, and brightness)

and quantify the brightness of a color as a value independently of the brightness value of the color

It looks really bright!
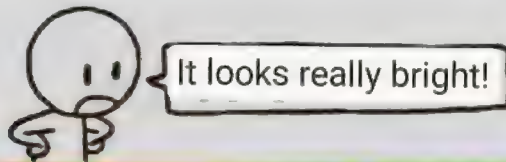
The higher the saturation,

the more pronounced the difference in value for each color
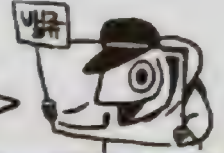
Saturation 100%

채도 0%

at high saturation   Silver value is bright,

·Blue and purple are dark in value.

Even if the brightness of various colors is constant,

if the brightness of the final color is different,

you should check the value, not the brightness.

Even with the same brightness and saturation, the value can be handled according to the color!

채도 0%   밝기

color distribution
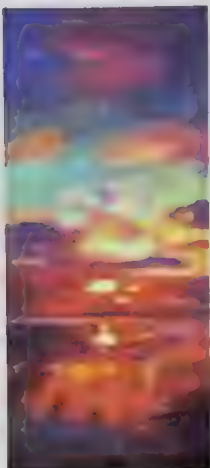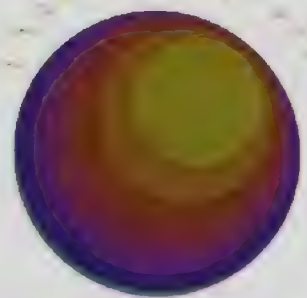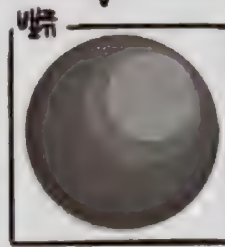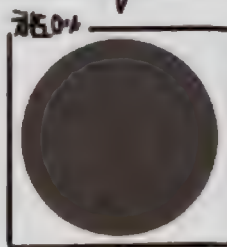
If you consider the

value when using colors,

you can color naturally even

if you use

a variety of colors!
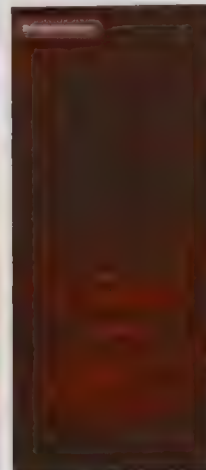
The lower the saturation, the

smaller the difference in value per color,

so you can select a color relatively easily.

However, when using a color with

high saturation, you must check the value.

3_Points to note when coloring in digital painting

Earlier, we talked about light and color, and studied addition and subtraction mixing. Let's look at an example of how these colors are mixed

Lighting (additional mixing)

The more light you add, the more intense and saturated the color becomes

As more light is added, the saturation gradually decreases, but...

. haha..
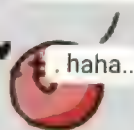
Watercolor (subtractive mix)

The color gets darker with the pigment!

However, digital coloring does blend in a different way than in the example above when colors are mixed

Therefore, when coloring the expression of color by light, it is difficult to color naturally

]Add opacity! [

You can change the name easily, but...

When different colors are mixed, the brightness or brightness It does not change constantly.

Of course (isn't it?)

However, it is very important to control the saturation to express 1 light!

Additive mix(?)   Subtractive mix(?)

By changing the settings in a digital painting tool such as Photoshop, you can color by changing the way color mixing is calculated
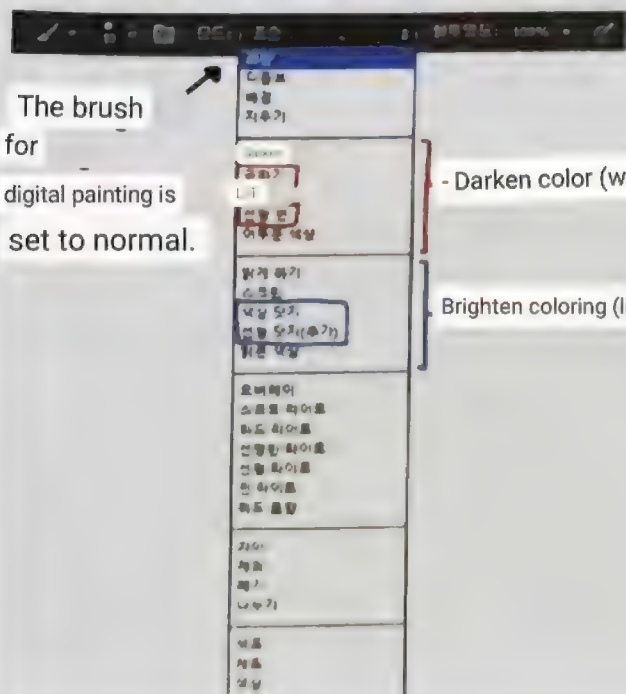
The brush for digital painting is set to normal.

- Darken color (watercolor)

Brighten coloring (lighting)

ex) What if you add blue light?

Why is the saturation of the light-dark boundary like this?

(X)

standard brush

new dodge brush

(IN)

TMI
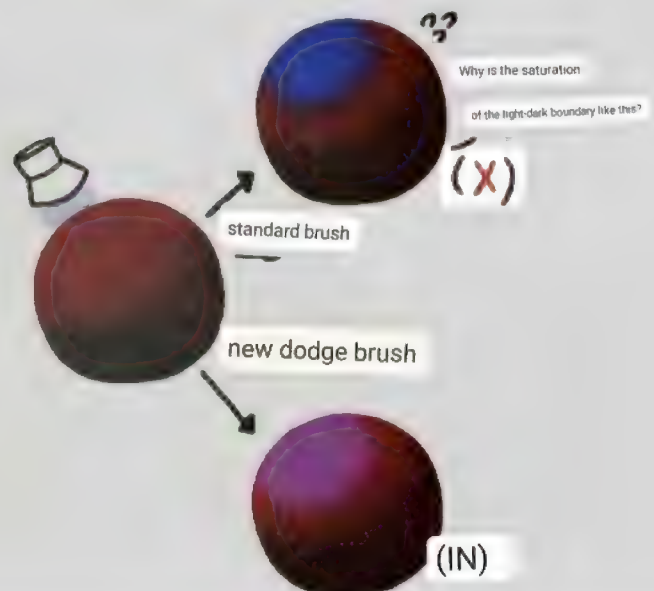
▶ Are infrared and ultraviolet rays invisible?

The human visual system can usually distinguish more than 10 million colors. Humans usually distinguish colors through three cones, but sometimes, tetrachromats can distinguish colors more delicately than normal people. However, with the exception of some species of primates, most mammals do not distinguish well between red and green. However, some animals other than mammals have more than four color vision. Insects can see ultraviolet light, and snakes can see infrared light indirectly. The crayfish is famous for being a creature with 16 angles of color vision.

mammalia | humans and some primates | Butterfly (6 color vision) | Snake (sensing infrared light as heat) Crayfish (10-16 color vision)
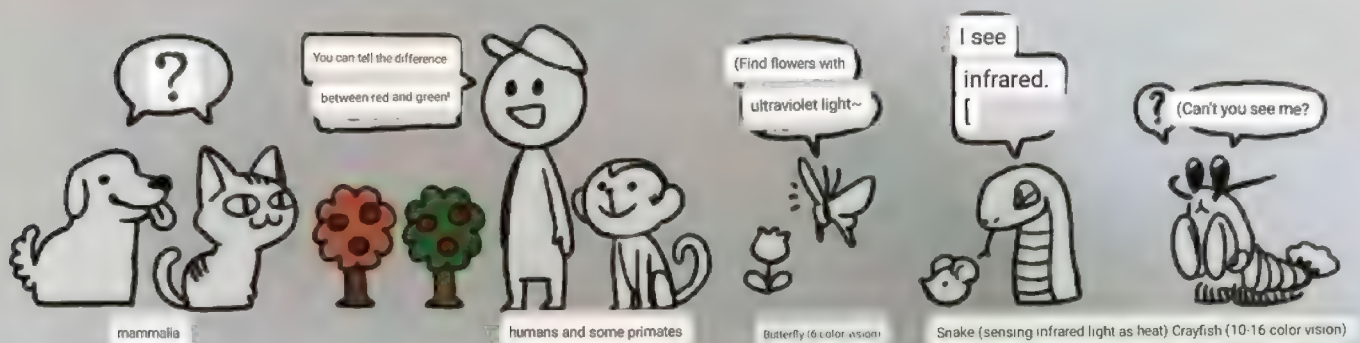
▶ The link between color and language

Former British Prime Minister William Glaston (1800-98) was a famous bookworm, especially the ancient Greek citizen Homer. Glaston makes an interesting discovery while reading Homer's work. Blue never appears in Homer's work. He concludes that Homer and the ancient Greeks were all color blind.

In fact, the word blue did not exist in ancient Greece. In ancient texts, the colors black, white, red, and green and yellow only gave rise to the name of the color blue. In fact, the Himba of Africa have different names for yellow, green, and blue, so they can easily distinguish colors that we cannot distinguish, and cannot distinguish colors that we can divide our households.

PART 02

light

HERE ON
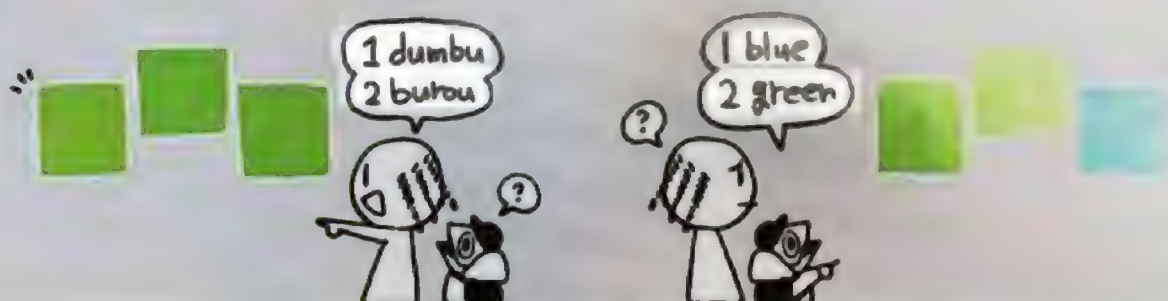
1_ Basic practice of light and color

1. Effect of light on color

In the beginning there was no light.(?)

Light it up~!!

There is no light to illuminate the object

Because it didn't...

?

The colors of everything in the world were indistinguishable!!

"I

cute bunny ❤

(I am a pretty flower)

bye

The world was infinitely monotonous...

A dark age when art disappears...

X

쫌...

At this time, a warrior with light appears!

"My. I..."

- the world

I'm going to color it!!"

두둥

등장!!

next...
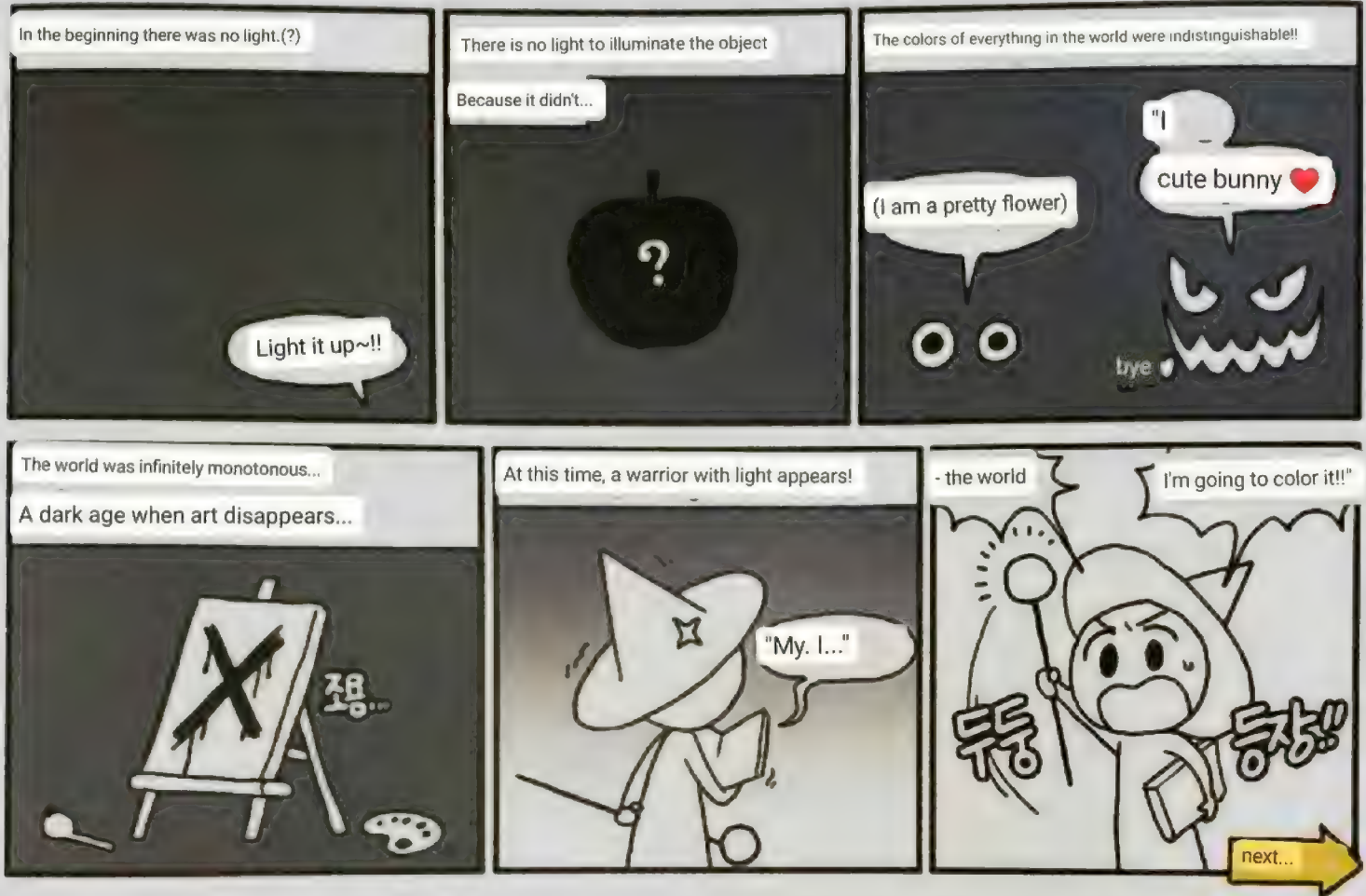
The reason we can see objects in the world with our eyes and distinguish them by color is because of the existence of light.

In a world without light, the eyes cannot perceive the color or even the

shape of an object. Now that you know about light and color, let's look at how light affects color.

Glossary of terms

light source   self-luminous object

빛   energy that illuminates an object

object (object)

Saturation

H S
   B

Hue

Brightness

[First, let's illuminate the "achromatic" object!)

oh! Finally, an achromatic object!

Color (H) and draft (S)

H S x
B ▬▬▬▬ 0

ok success!!

White
B ▬▬▬▬ 90

The color brightness (B) is being filled!

B ▬▬▬▬ 40

B ▬▬▬▬ 10

?
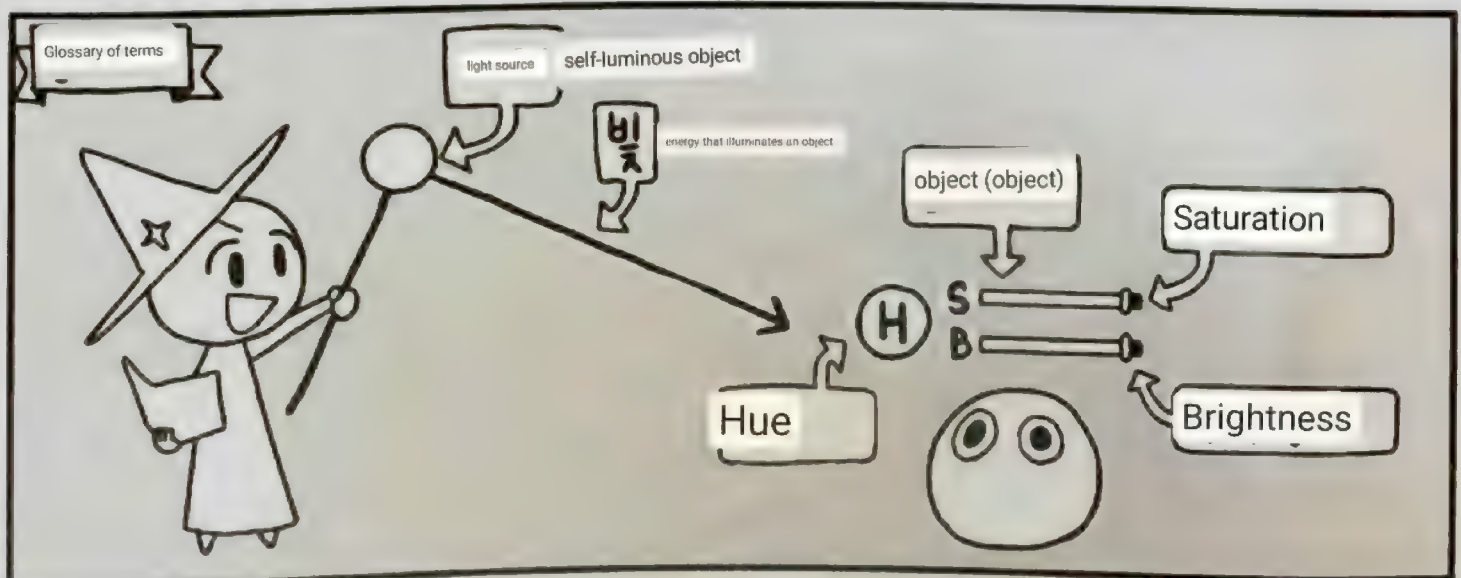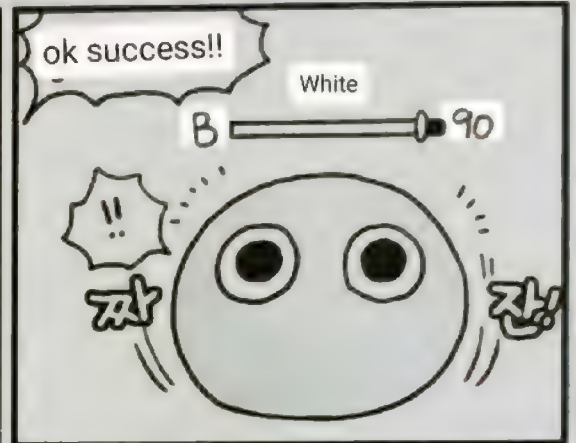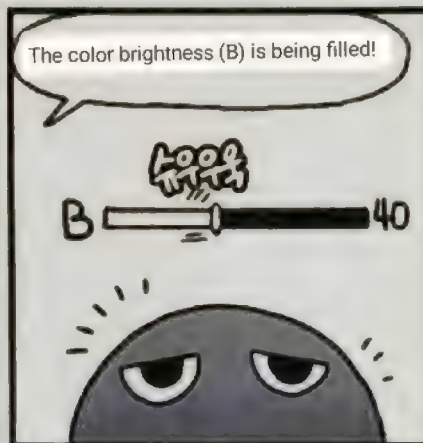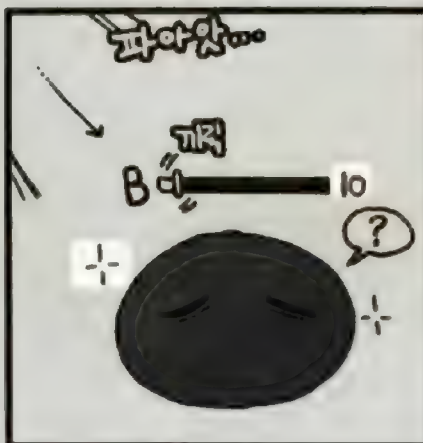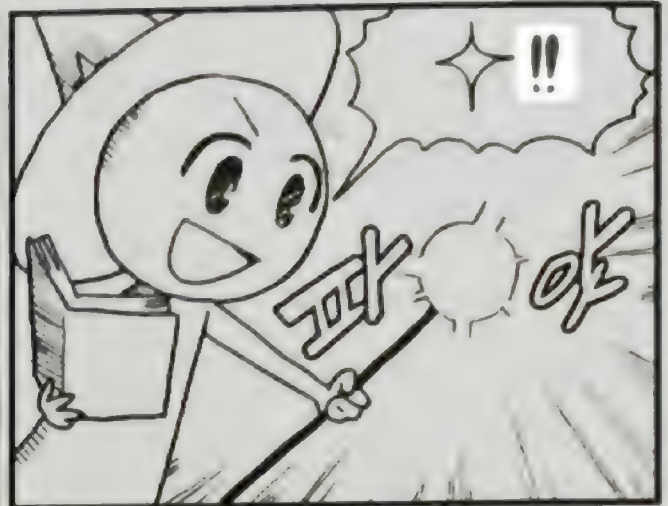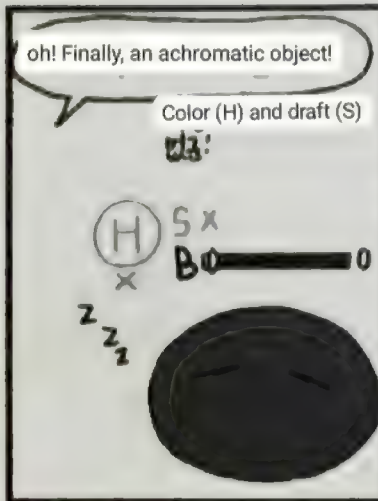
*) Achromatic color A color that has no color value and therefore no saturation (S) value

When light hits the object to be observed and the object reflects the wavelength, the color brightness of the object increases. Here, the areas where the light hits and reflects brightly are divided into highlights, and the dark areas where the light does not reach are divided into shadows.

list

reflect

-shadow

You must have a highlight and a shadow to draw a three-dimensional shape of an object!)
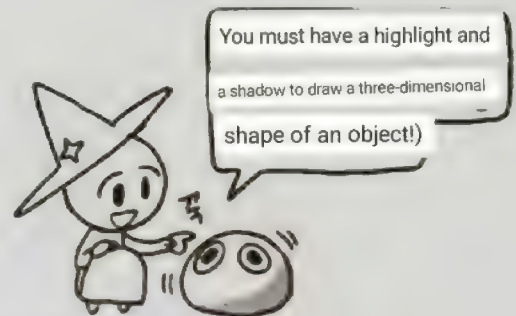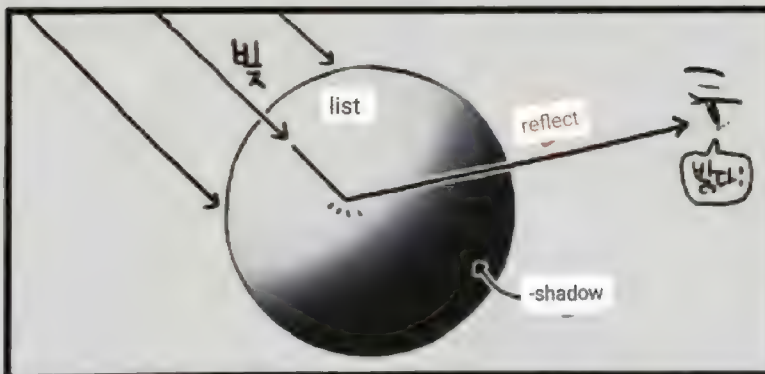
Every object absorbs light of a specific wavelength, and black among achromatic colors absorbs all spots, so it doesn't reflect light, so the brightness doesn't increase. Conversely, white can reflect all wavelengths.

White
B ▬▬▬ 90

grey
B50

black

There's no shortage of light!'

100Lx
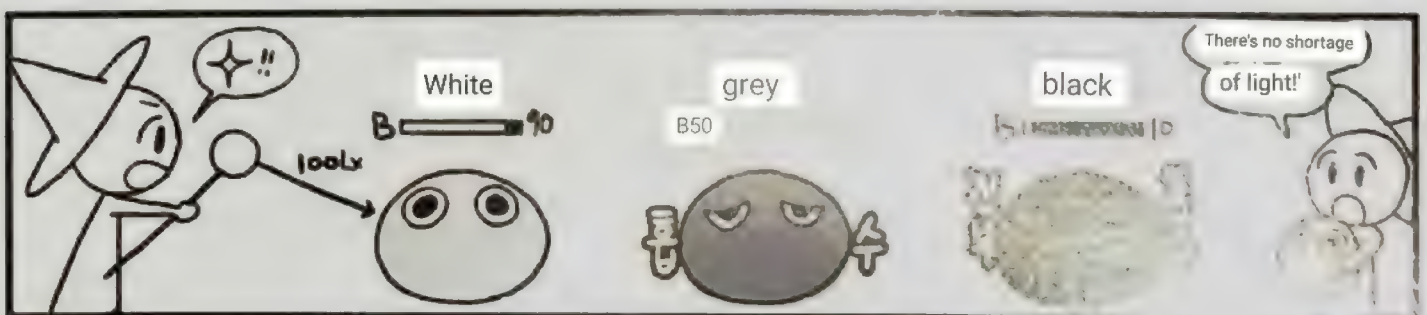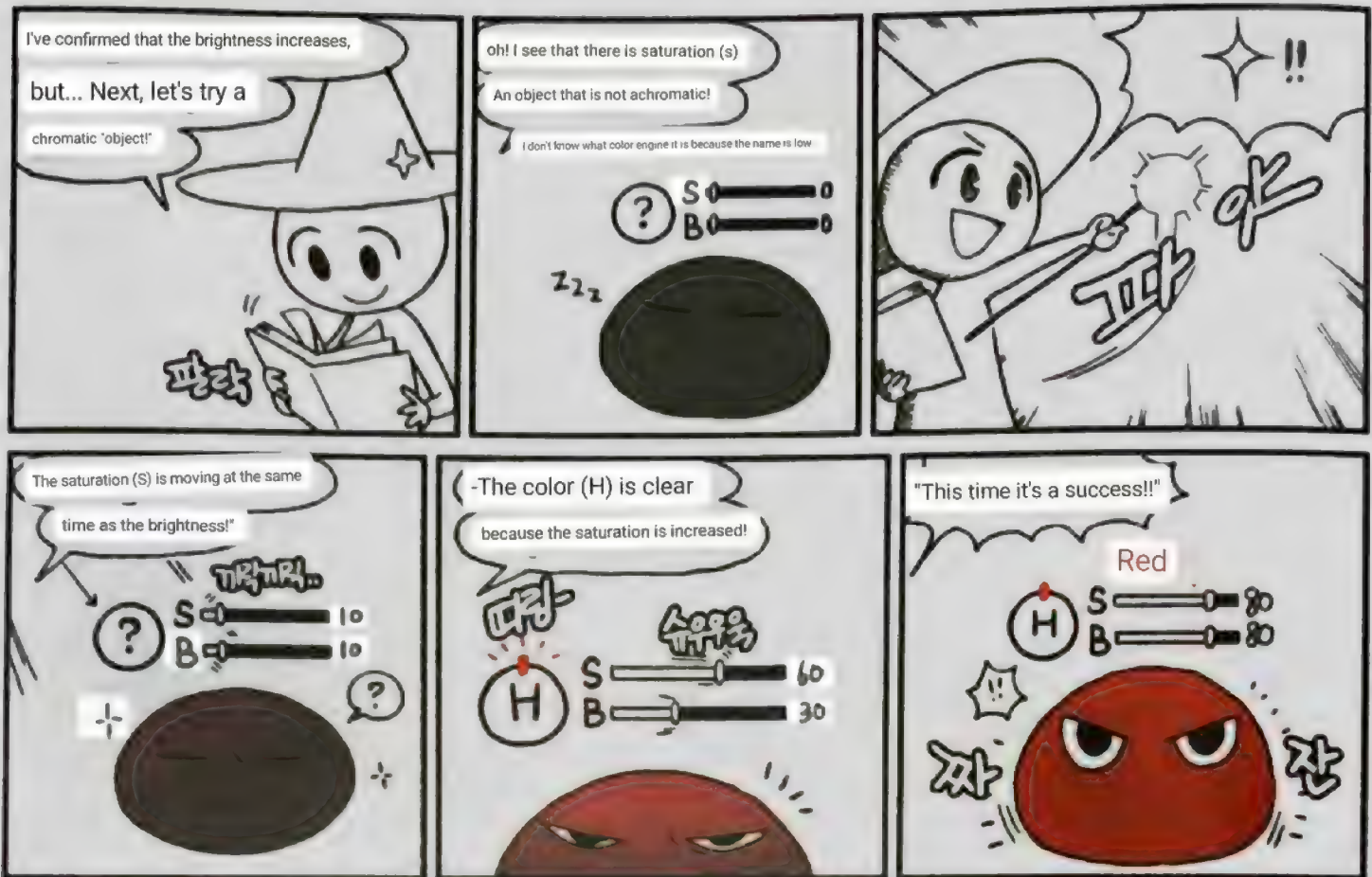
1) Chromatic color: A color with a specific hue (hue) Saturation is determined according to the vividness of the color

When an appropriate amount of light reaches an object that is not achromatic, the object can absorb certain wavelengths and reflect the wavelengths of a given color

It is said that the light reflected from here and reaching our eyes becomes a color, and the more vivid the color, the higher the saturation
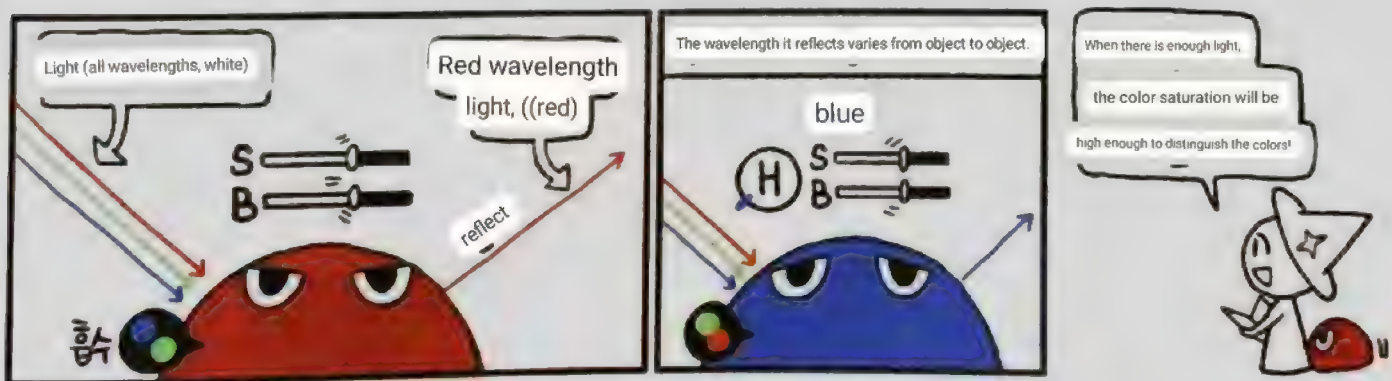
Because the specific wavelength that an object can reflect is also limited by each object, some objects do not become

saturated no matter how strong the light is. These colors are called hypochromic, and achromatic colors are also non-saturated colors.

So, shall we summarize our journey so far?
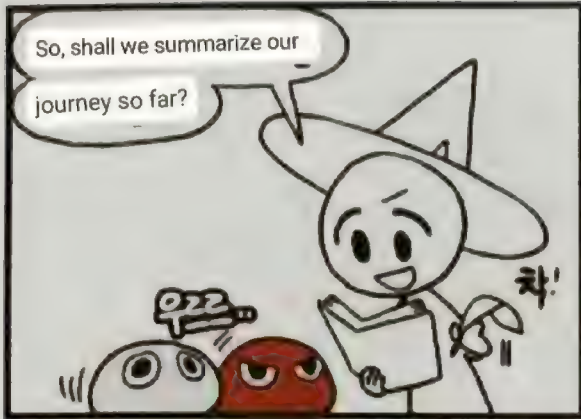
for a moment.

The relationship between light and color is especially important for the basics, so it is helpful to understand the content later if you know it carefully!

Basic terms and principles...

① We can observe objects only in the presence of light.

③ If there is not enough light, the brightness cannot be high enough."

② When light is reflected, the brightness of a color increases.

⑤ A chromatic object reflects a wavelength of a specific color when exposed to a sufficiently bright light

④ Colors that absorb light do not increase in brightness even if the light is bright enough.

⑥ Likewise, if there is not enough light, the brightness and ion are not sufficiently incree...

- The repainted object does not increase in saturation any more, even if ⑦ enough light is shining on it.

1) This is called a shadow.
2) This is called reflected light.

It was said that a three-dimensional form appears only when there is a highlight and a shadow...

good! If this is the case, 'In the future... huh?

"Aww!! There's a color (+) on my light!!!

paat.

2. The color change of an object due to the color of light

First, the easy white object
•Let's find out... Ah!

$B \longrightarrow 0$

Let's do it!!

good! As expected, the popularity is increasing.

$B \longrightarrow 10$

It is obviously an achromatic object, but it has the
same color and saturation as light, right?!

with

H $S \longrightarrow 50$
$B \longrightarrow 50$

because it shines red
It has turned red!

Red

H $S \longrightarrow 80$
$B \longrightarrow 80$

It's a little surprising...2

"I think it will definitely help...

Because
there is not only white
light in nature

Light with the same intensity of all wavelengths becomes white (achromatic) according to additive mixing. However, light with a relatively strong region of a specific wavelength (ex. red) takes on a specific color (red) depending on the wavelength. Since light has relatively weak intensity at different wavelengths, it cannot fully illuminate the color of an object. The color of an object is affected by the light source, so the color of the object changes according to the color of the light source (light)

(Light with even wavelength (white))
The color of the object appeared intact

White
Bo $\longrightarrow 10$

Red

H S
B
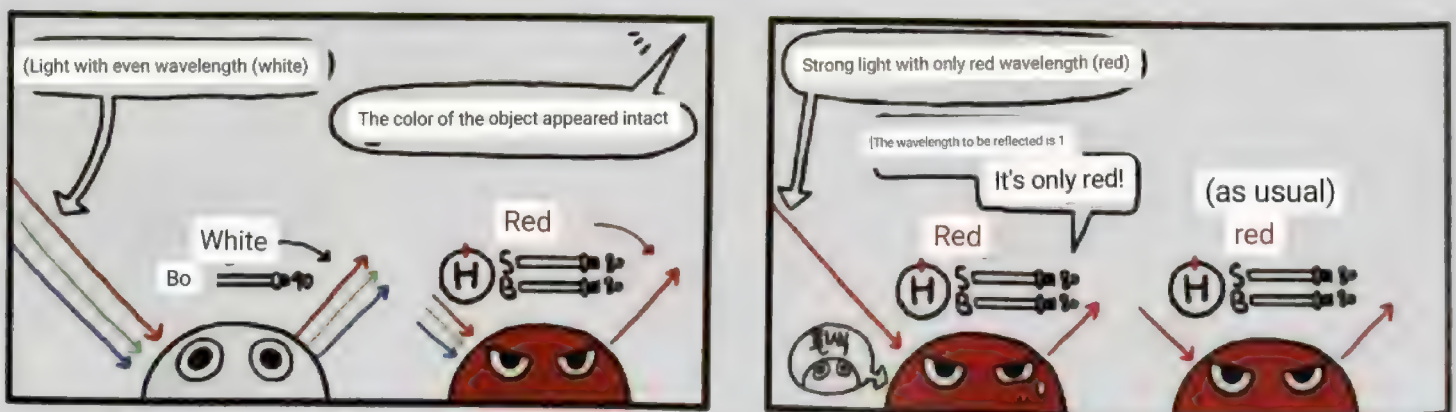
In achromatic light, the color of the object is fully reflected.

Strong light with only red wavelength (red)

[The wavelength to be reflected is 1

It's only red!

(as usual)

Red

H S
B

red

H S
B

The color of an object is affected by the light source
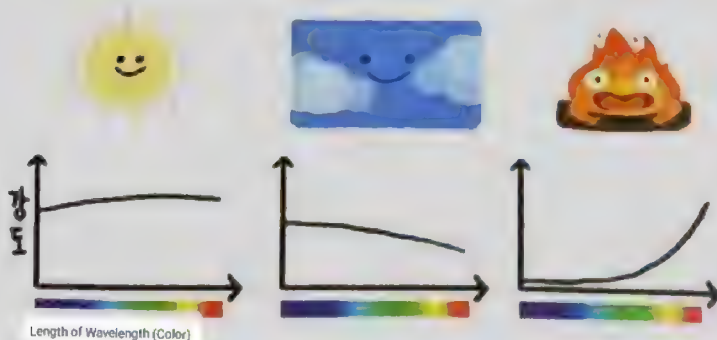
It's a must-know because there is no perfect

The color change of an object due to the color of light

white light in nature!

Because the color of light is made with the combination of RB!

Length of Wavelength (Color)

Panel 1: Then, observe the color change of colored objects!
White Red blue

Panel 2: Achromatic objects are 2
"Becoming red..."
white + red
H S B

Panel 3: • Red objects are still red!
"Then what about blue...?"
Red
H S B

Panel 4: Saturation and brightness increase...
What is the state of color (H)?!
Hue S B

Panel 5: "Didn't the blue color change completely?!"
purple
H S 60 B 60

Panel 6: This... this is not three colors...
Second color?!

If so, what color will the object change when light of a certain color is reflected from a chromatic object? Each object

has a specific color that can be reflected. If the intensity of the wavelength of light is sufficient, it reflects vividly (high-saturation,

high-brightness), and if the light lacks that wavelength, it reflects it weakly. White

light with a constant intensity of all wavelengths can show the original color of an object, but chromatic light (light with a strong specific wavelength)

does not illuminate the object sufficiently or changes the color of the object. At this time, the color change depends on the additive mixing

11) The white light is
The wavelength is sufficient for an object to
reflect its original color.
H S 10 B 10

12) Light that has only a specific wavelength
reveal the color of the object 4) Therefore, the strong wavelength (initiation ceremony) and the color of the object are additively mixed.
The color is determined.
(the blue wavelength
'Is there nothing..?"
H S 20 B 20
even this...

13) Natural light does not have only a specific wavelength. It does not fully

peel!
H S 60 B 60
"Blue is the limit...!!
is
relatively low

1) white light
2) laser pointer
3) neon sign
④ Additive mixing
The primary colors are combined to create a 'color created!

Understanding the color wheel

Although we have theoretically examined the fact that the hue of an object changes depending on the color of light, it is difficult to intuitively understand the change because color is a property of color, not light. Changes in color can be viewed through the color wheel.

A color that shows the cycle of Hue.

See you again!

Can you tell the difference between color and hue?"

Because the color of the object color is affected by the color of the light, the color of the object color shifts towards the color of the light source

Oh Let's light up the low quality...

→ Color of light

(Ariwa!:)

In the process of moving, the color (H) changes and the brightness and saturation decrease

* color of object
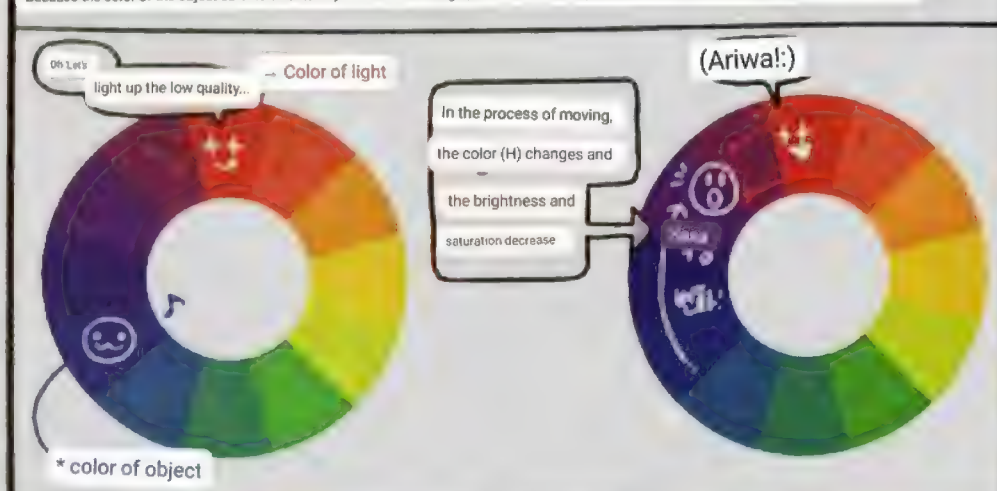
The more the color changes, the lower the brightness and saturation of the color.

The clearer the color of the light, the more it will have to move!!!

The color is ultimately determined by the light!

Haha..."
It's hard...

This is called an adjacent color)
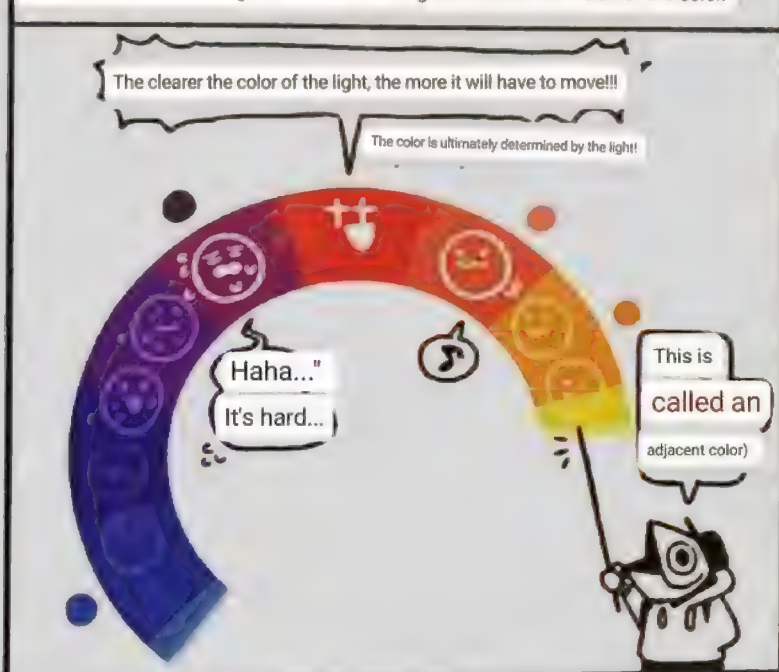
Saturation and brightness change depending on lighting and object color

"If only there were light, I think I can make all the colors in the world!!

/Come on.. wait!!
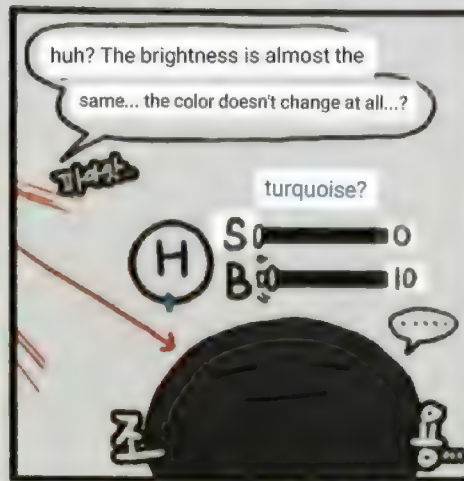
In the process of color appearing on an object, light of a certain wavelength is reflected from the object while the other wavelengths are absorbed. For example, if white light hits a cyan object, the red wavelength is absorbed by the object, and the other wavelengths, blue and green, are reflected, resulting in cyan. So if you shine red light with no blue or green wavelengths, the cyan object will absorb the light and appear very dark.
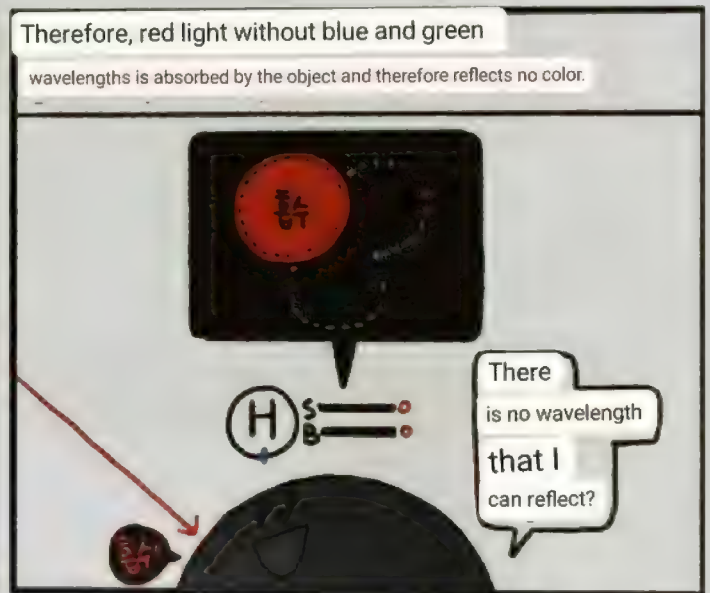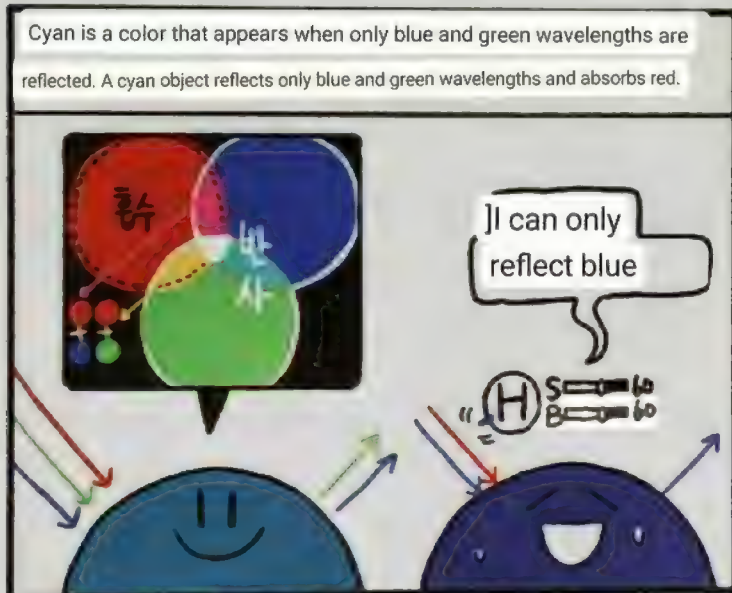
When understood on the color wheel, both the original saturation and brightness of an object are lost in the process of color change
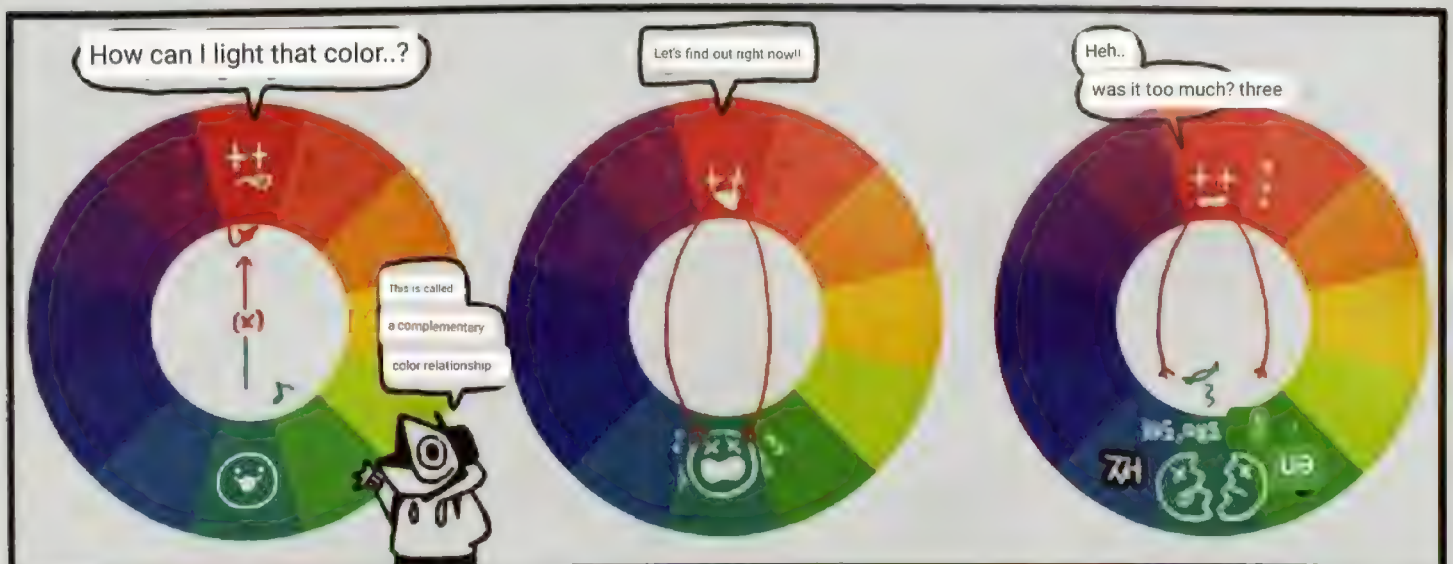
3. Example- Color change of an object by light

red and white objects
Both reflect red well, so
water shows up well.

Window plants
absorb red wavelengths,
so they look very dark.

*White.

the original color of the object

Where the white light shines.
the original color //
the object appears well

Green is added to the object color of the shadow.

compared to regular plants
Objects do not reflect light
well, so they appear dark.

+ green light

Objects appear black when
illuminated by pure color light

*The color of the object is always darker than the light source. If a color appears on the object
that is brighter than the light source, then there is an
additional light source that is brighter than the light source

Additional light source

It's basic

As it applies to all principles of light and color
Let's make sure we understand!!

heh...

It's a little difficult, but [record carefully...

Would you like to see it too?
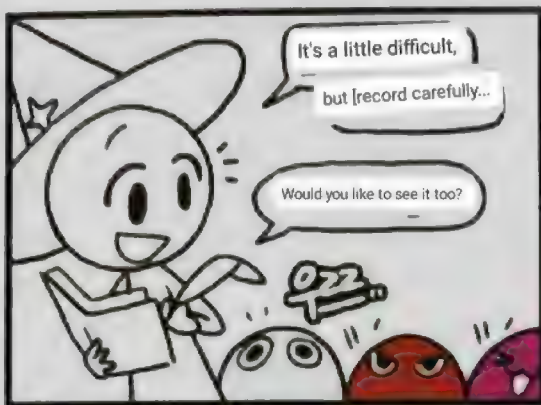
We also used virtual light that does not exist in nature (light with a specific color wavelength).

There may be a slight difference from the actual color that can be observed.

The answer to the question is at the bottom of the page!

> Fill in the following blanks.

1. Depending on the [light], the light takes on different colors.

02 When the light from the light source is applied to the object, the color of the object appears

03. When an achromatic object receives light, the [] of the object rises. Q4. The color of a chromatic object increases as it receives strong light

[][] increases.

> Choose a white object from the following.

05 Postcard

A   B   C

Q6.

A   B   C

Q7.
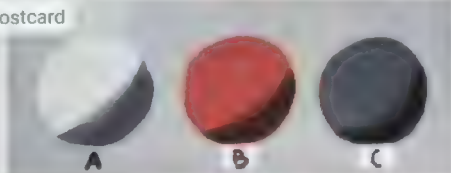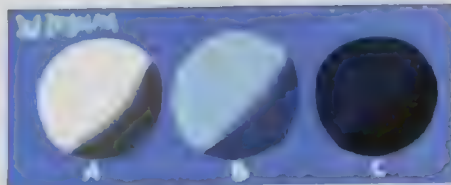
08. When yellow light shines on a red object

What color is the object?
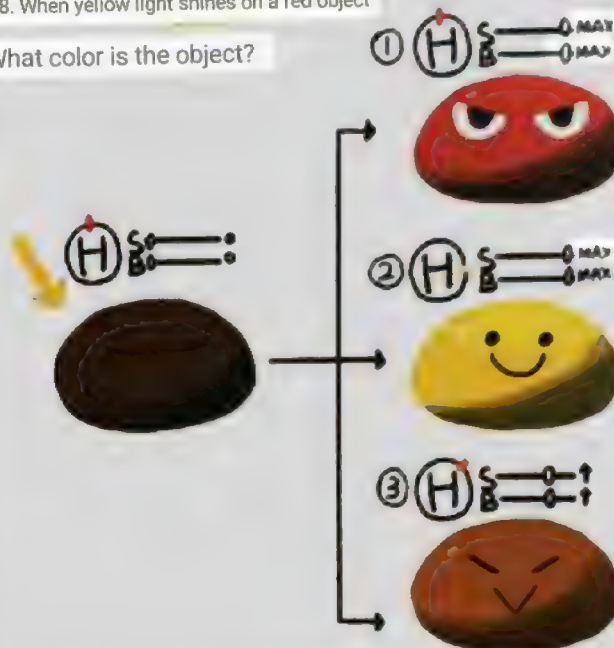
09. If you shine red light on a cyan object, the color does not change. Why?
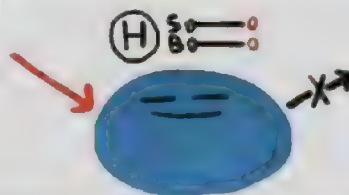
① Adding red to cyan makes it darker.

② Because the observer's psychological factors acted

Because the object absorbs all the wavelengths and there is no wavelength to reflect

Because red is a warm color, it is impossible to reveal a cool color

(Okay!)

Let's keep going!!!
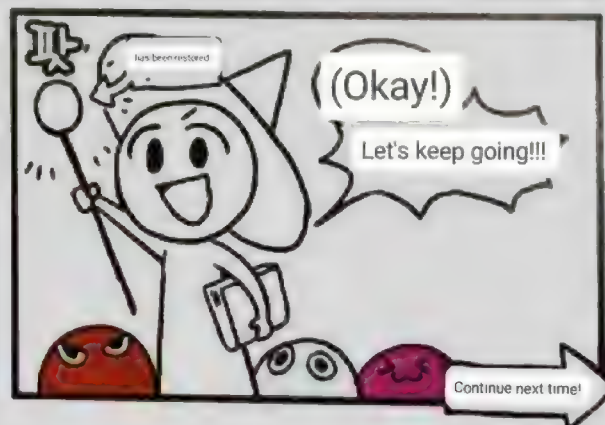
2. Illuminance

1. Luminance, Illuminance, Latitude

How to say light intensity? The intensity of light is called the luminous flux, the intensity of light in a specific direction from the light source is called luminosity, and the value that indicates the intensity of light received by a certain side of an object is called illuminance.

(Unit: Lx) Illuminance is reflected from the object to our eyes. It affects the amount of light (luminance), and the perceived color changes depending on the luminance.

Luminous flux: total amount of light from a light source

Luminance: the intensity of light shining in a specific direction

Illuminance: Amount reached the target surface

Luminance: Brightness of the reflective surface

빛

빛 →

Wouldn't it be better to talk about luminance?

Luminance is important in certain situations, but illuminance is useful to understand the direct relationship between light and color.

Among them, it is the value of illuminance that directly affects the color of an object!

An appropriate amount of illumination is required for an object to have a full color. If the illuminance is low, the color does not appear well, and on the contrary, the intrinsic color of the object does not appear well even if the illuminance is too high.

In order for the color (■) of an object to appear accurately, first of all, the illuminance must be adequate.

Other factors are important, but...

Lack of light..

Too much light!!!

Illuminance and color of the light source are not suitable!

It is appropriate!

2. Effect of Illuminance on Color

Since light is energy, it was found that brightness and saturation increase when light hits an object.

If so, what will happen when the illuminance changes?

① For any color, the higher the illuminance (additional mixing), the higher the brightness unconditionally

So, what happens to chromatic colors with hue and saturation? First of
all, it is important to know that saturation is a property
x̄ of color. Degree refers to how vividly a color appears in a color.
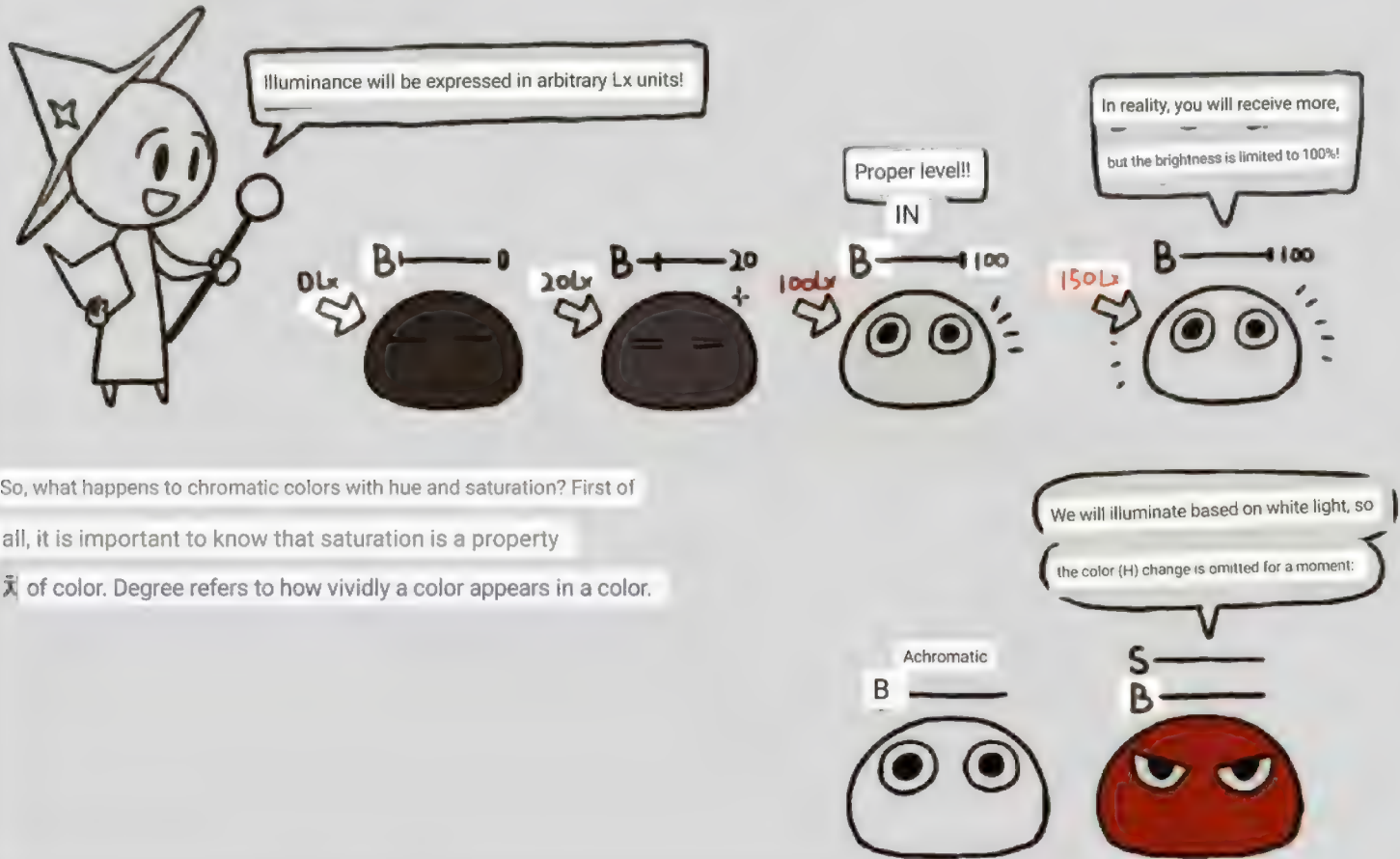
② If the illuminance is low, enough light is not reflected to our eyes, so the colors do not appear clearly. Also, if the

illuminance is too high, the object does not absorb all the wavelengths it absorbs, but reflects some along with the object color. Therefore

③ if the illuminance is too high, the object will reflect more light than necessary, and the colors will not appear clearly
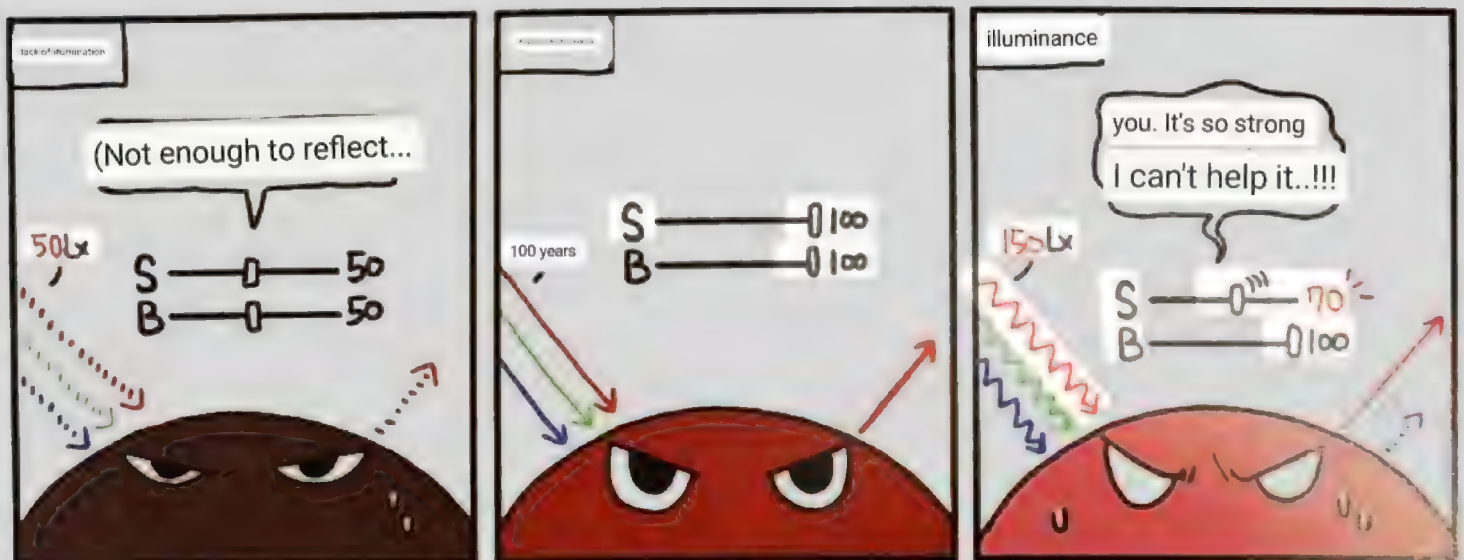
3. Illuminance of list and shadow

The company's objects have different illuminance depending on the angle of incidence of light, so the colors of highlights and shadows appear different.

List (part that receives light)

Illumination is the most appropriate,

resulting in the most vivid colors.

shadow

The color appears dark because

no light is shining on it.

Angle of incidence. The incident light used to illuminate and the angle between the incident light and the plane normal.

- Contrast border

depending on the shape of the object

A light-dark boundary appears

between the highlight and the shadow.

The Yeongam boundary has relatively low illuminance

compared to the bright area, so a slightly darker color appears.

closed shadow

It's the part that doesn't get any

light, so it always appears black.

At this time, the color of each part changes according to the illuminance.

- As the overall illumination is

insufficient, the highlights are also dark.

- Because the illuminance on the highlight is too

high, the saturation is rather low.

Since the illuminance of the contrast

boundary has become appropriate

The sharpest color (high saturation) appears

at the border of light and dark.

For reasons of reflected

light - the shadows are also brightened together.

Closed shadows

are always the darkest

regardless of the light level.

excessive Illuminance

Draw a dazzling light!

S 500 !!
B 300 !!

(That..that)

'It's a bunch.. o
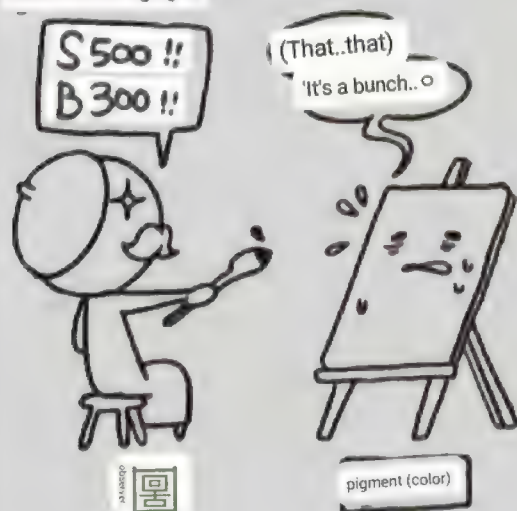
Even if the illuminance is too high to reduce the saturation

of the highlights, in reality the highlights may appear brighter and more

vivid than the contrast boundary. However, there are limits to

Because there is, when you need to express light as a color

the brightness and saturation that can be expressed with pigments.

You should actively use the relativity of saturation.

pigment (color)

4. Camera, exposure and luminance

The eye is said to be the best camera. This is because, independently of the illuminance, the degree of light entering the eye (luminance) is unconsciously controlled

In order to capture the correct light and color of the world, you need to change the exposure value by adjusting the aperture of the camera

The human eye automatically processes this and turns it into color, but to recreate an image as a picture, you have to treat it as if you were manipulating a camera

lens　iris　film　retina (film)　Iris (shellfish) eyelids (shutter)

The amount of light reaching the eye at this time is called luminance

1) Exposure value: The amount of light captured in the photo by adjusting the shutter speed and aperture value

셔터

-Lens (lens)
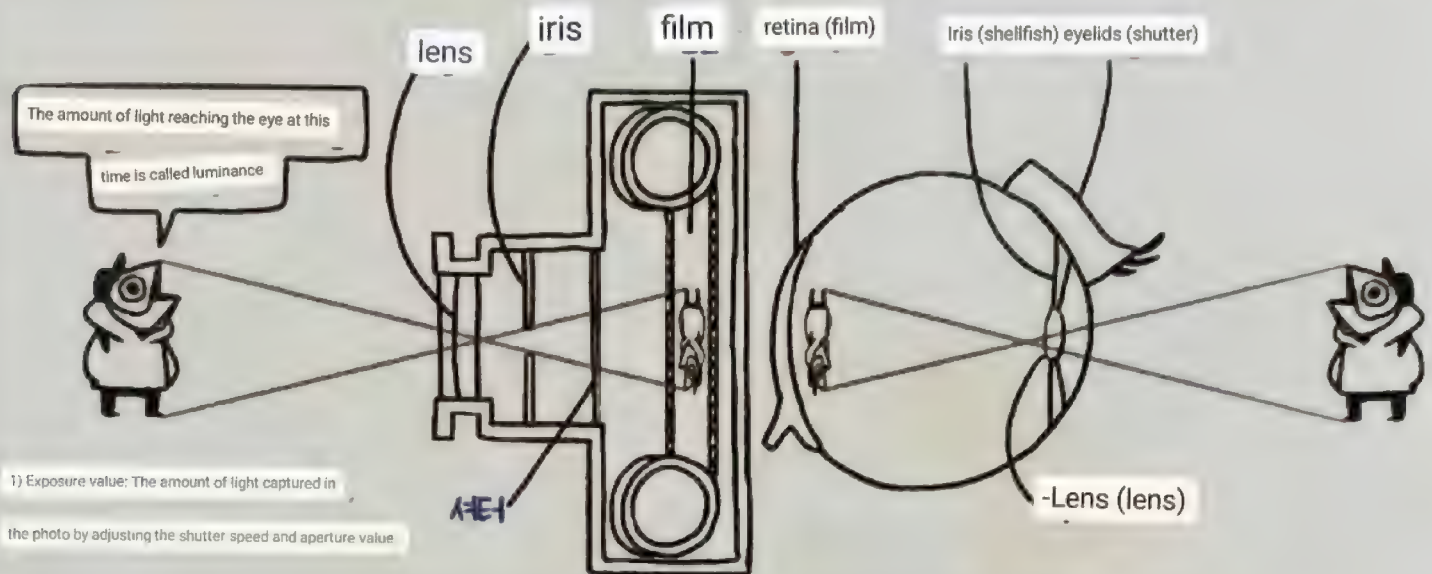
Just like adjusting the aperture of a camera, you can adjust the illuminance and luminance according to which part of the object you want to capture

The person looks good in the photo, but the background is too bright, so it's hard to see.

If you can't change the illuminance, let's lower the luminance by adjusting the aperture!

찰　칵

Conversely, when you want to express strong light, you can control the atmosphere by adjusting the illuminance and luminance

100Lx

Instead of a list, on a light-dark boundary

I just need to paint it with a high-saturation color!

good life!

I want to express a much stronger light...

Colors are limited.

150Lx
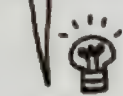
Environmental light and reflected light, which will be explained later, < Make full use of it!!

5. White Balance

Perfectly white light is very rare in nature, and even rarer to illuminate an object with adequate illuminance. Therefore, most of the colors of objects we can observe are slightly different from the original colors. In photography, correcting the color of an object that has changed according to lighting is called white balance correction. In photos, the white balance is adjusted to find the original color of the object, but the brain automatically corrects the color through memory contrast.

Illuminance

in blue light... weak...

I need to increase the exposure value and increase the color temperature!

white balance adjustment

Apples are originally red, aren't they?

If the light shining on an object or space is well applied and expressed as a whole, even if the exact color of the object is not transmitted to the brain, the brain compares the surrounding color with the color of the object's surface and perceives this information as a subjective sense, that is, a true color

II seems
to be unique in the first place

As such,
light is an objective thing,
but color is a very subjective
and -psychological sense.

balance illusion

guess. *White

Meanwhile ..

The stronger the
light, the more vivid the color!

uh? Are you trying to evolve something?

Aww!!
It's no longer pure red!!

Continue next time!"
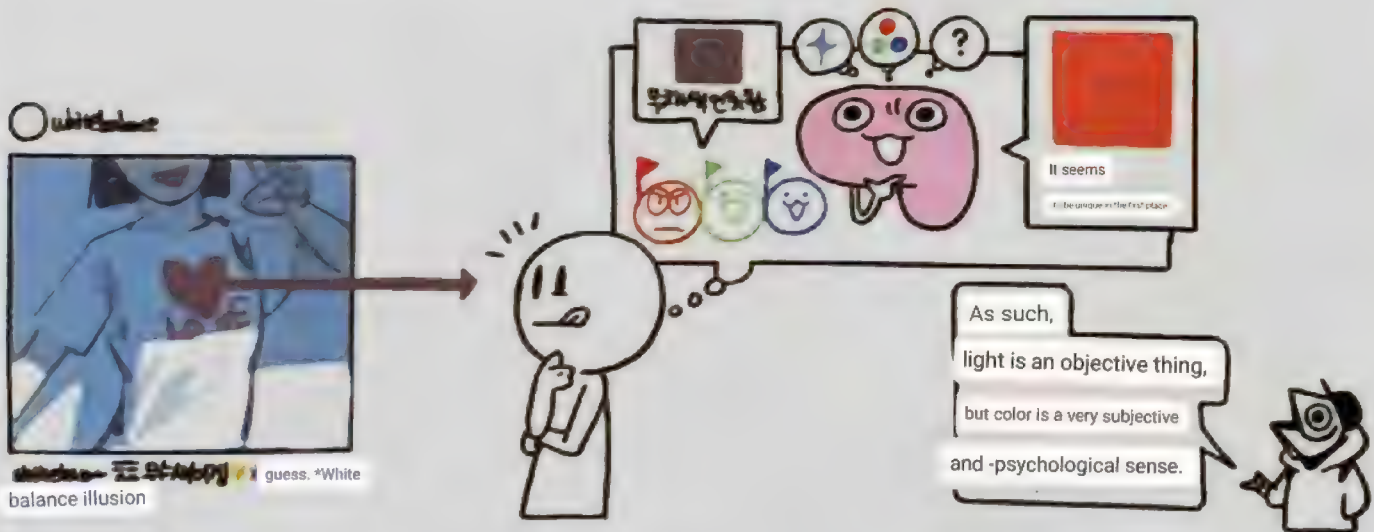
Let's clean it up!™

If the unique color of the object appears clearly on the bright spot, it can be considered that the illuminance of the light is appropriate

If the illuminance is not appropriate, vivid colors will not appear on the highlights.

(excessive illumination)   (lack of illumination)

However, when expressing light in a picture, 1 proper illuminance and the correct color of the object are [not essential!

Even if the illumination is inadequate, the brain corrects the white balance and recognizes the color of the object →

[However, let's observe and understand how the color of the same object appears depending on various conditions.

original color

It's fine

3_Main light source, indirect light, and shadow

1. What is indirect light?

When light strikes multiple objects, each object reflects a specific light from the light source, causing it to be perceived as a color. All colors and objects we can see with our eyes reflect some light, and this reflected light sometimes strikes a significant amount of light on an adjacent object. In this way, the light that illuminates an object indirectly rather than directly from the key light is called indirect light.

Keylight

-Ambient light

"shadow

There is a hardness that the reflected light is colored!

I'll shine them all the same

반사광(reflected light)

① Key light

· Joo Gwang-won

Ah..

Shadow into complete darkness!!

Wouldn't it be too much to reflect...?

We're barely revealing it... hehe

A light source that shines light directly on an object. In environments where only the main light is present, the shadows appear as complete darkness. In other words, unless the shadow is complete darkness, something other than the main light source is illuminating the object.

Where the hell are you lighting it?! I can't see the V light source!!

In outer space, shadows appear black because there is no light source other than the main light source.

Indirect light does not appear well when the illuminance of the main light source is low

② Ambient light

Environmental light (or ambient light) refers to light that is not incident directly from the main light source and illuminates an object from a very wide direction as if the

light from the main light source is reflected from the environment or space and surrounds the surroundings. A typical example is the blue sky that has been brightened by the sun.

I am the main light,

I'm sure it's blue too

Indirect light
is a bit weak

This is
the area of the main light source

명부 그림자

Originally it should appear black, but
the ambient light brightened it to blue!

(I) <I'll reveal it to you)
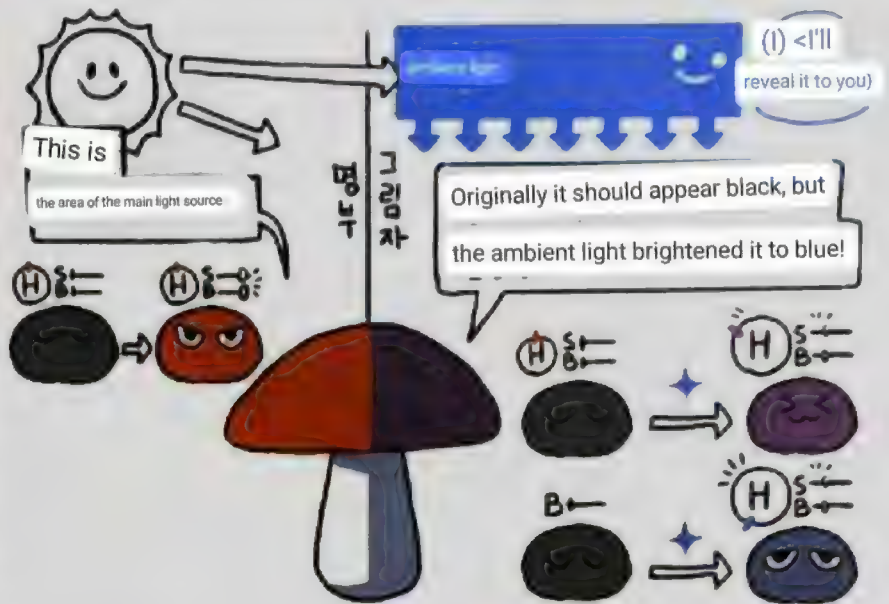
Since ambient light is a kind of reflected light, it is relatively weaker than the illuminance of the

main light source. The bright area that received light from the main light source is affected by the ambient light,

but it is difficult to clearly show the color of the ambient light itself because

the light is added. The ambient light thus serves to illuminate the shadows created by the main light source as a whole.

main light source

environment device

「Highlight

illumination

100x (o+20) 27

shadow intensity

20 lx

It is not necessary to add the
color of the ambient light to the list. It
—
is already added illuminance

③ 반사광(Reflected light)

The light reflected from an object can be perceived as a color, and at the same time, it reflects the light of that color to the surroundings. ·Reflected light is

necessarily weaker than the main light source, but it can become a significant light source depending on the illuminance of the main light source and the material or distance of an adjacent object

100Lx

(Although a
little weak (I'm shining too!)

20L

조↑

150Lx I'm strong

enough now!!

ПОLx

Indirect
light
can be anywhere.

④ Types of shadows

The area where the light does not reach from the light source and appears as a relatively dark color compared to the highlight

is called the shadow. Indirect light is more visible in shadows, as it can affect areas of shadows that the main light cannot. Let's learn the

types and names of various shadows that show three-dimensionality, and learn the characteristics of shadows

The halftone is a shadow that only partially reaches and casts a light shadow.

Form shadow

It is a three-dimensional shape that is darkened because the light does not shine when the light shines on it.

-shade, cast shadow

This is an area that is darkened by being obscured by an object.

As the distance from the object that is being covered

increases, the interference of light increases and the contrast of the shade becomes blurred

Also called penumbra.

⑤

-Occlusion shadow

⑤ Occlusion Shadow

Indirect lighting brightens the overall shadow of an object, but there are places where even indirect

lighting cannot. The light does not reach both the main light source and the indirect light, such as a tangent or a hole, which is not a

shadow such as a shadow. A shadow that is not affected by illuminance and light direction is called an occlusion shadow

Oh, it's too dark...

(I'm gone!!

ambient light

LIF..

point of contact

we too

(Clarify

Come on,

hey what is this
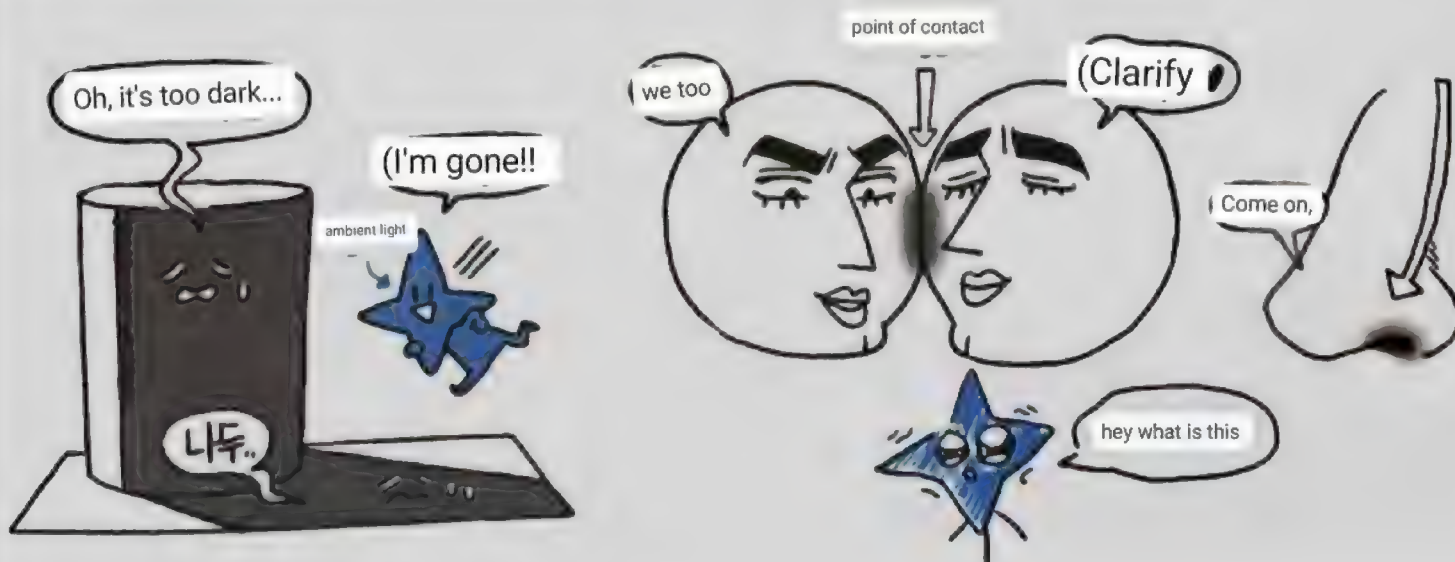
Using closed shadows in shadow expression

A technique called AC (ambient occlusion) map is used when realizing light attenuation due to light shielding in 3D renders, etc. Using AC Map,

you can express a natural and realistic feeling by making the shadows cast between objects and in corners darker. It is difficult to fully utilize

the AO map in coloring work, but it is possible to depict more natural shapes and structures by blackening the areas with closed

shadows and setting the illuminance and light direction.

[Before I paint all the shadows with the same brightness...

Let's paint the closed shadow that

appears on the face with 1 dark black.

- Ear hair

Depending on

the facial expression or the age of

the ear canal,

facial wrinkles may

appear as closed shadows

pupil

nostrils.

corner of

Achromatic objects

are easier to express.

The closed shadow remains

] dark even when the light direction is changed.

[Closed shadows look much

darker than other shadows.

The higher the illuminance,

the brighter the shadows,

200Lx !!

-Closed Shadow BO%

-Shade B30%%

TMI ▶ Why is the sky blue?

On a clear day, the sky is lit with blue light. Why is the sky, which is indirect light, blue when the sun, the main light source, is white? In order to understand why the sky is blue, it is necessary to first understand the phenomenon of light scattering, among them Rayleigh scattering. Electromagnetic waves, including light, have wave properties, and are classified into short wavelengths and long wavelengths according to the length of the wavelength.

[Short wavelength: energy is high and is scattered first.

Long wavelength: The energy is weak, but it can reach far.

Just go~

Hurry Hurry!

visible light area

Long way to go!

In the vacuum of space, scattering does not occur, so there is no color. V
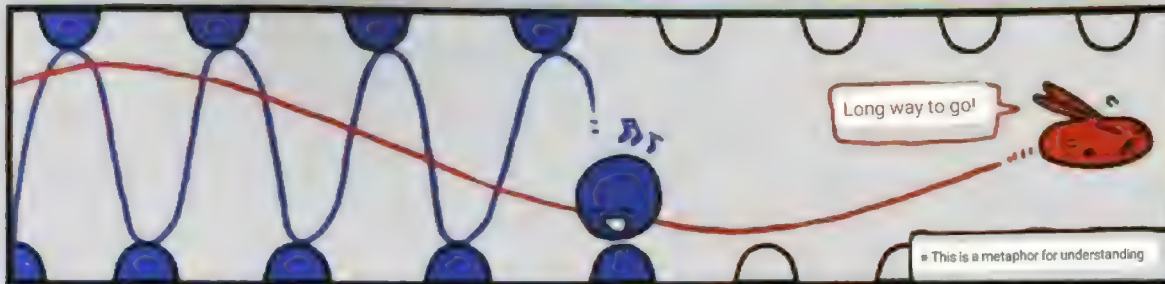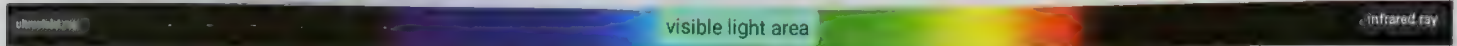
* This is a metaphor for understanding

When white light from the sun reaches the atmosphere, short wavelengths of blue light are first scattered by particles in the air.

Therefore, when light passes through the transparent atmosphere, short blue wavelengths are gradually scattered and the sky becomes blue.

[Not transparent]
It's blue!

The lower the luminance of the object, the better
It is greatly affected by blue light scattered in the air. So distant objects appear somewhat blue.
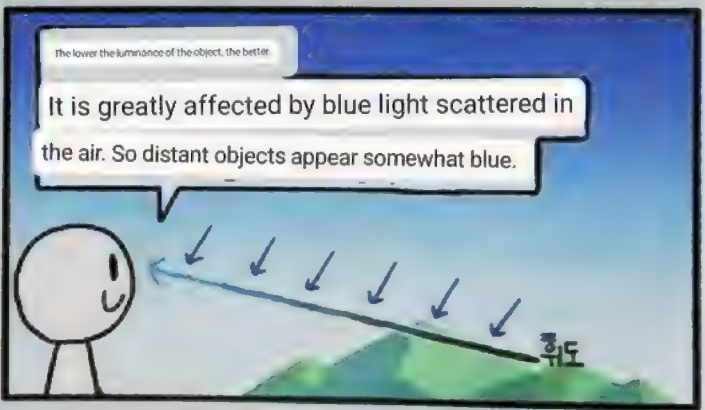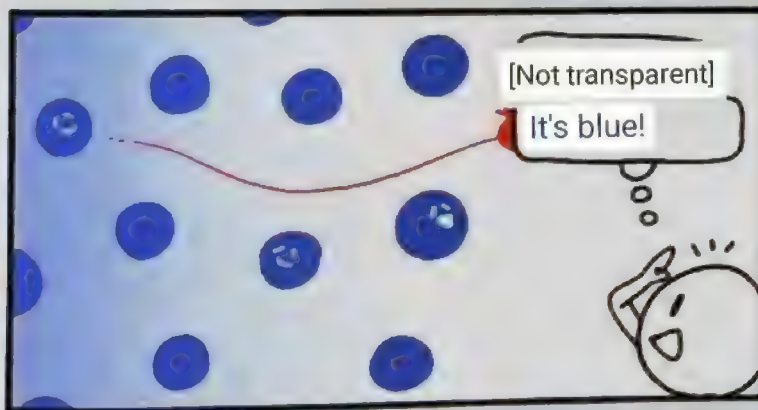
At sunset time, the sun's light must pass through a thicker atmosphere, causing more scattering. Short wavelengths are scattered first and disappear, leaving only long wavelengths, and the light of the setting sun reaching the eyes produces a vivid red color

I can't go any further

I've only just arrived!

The farther the light comes, the brighter the red!

Achromatic objects look very colorful during the golden hour when the red sun light and the blue environment are illuminated!

화경광

sunlight
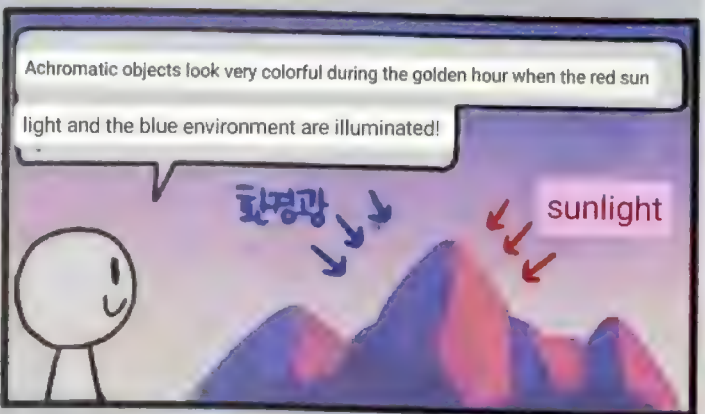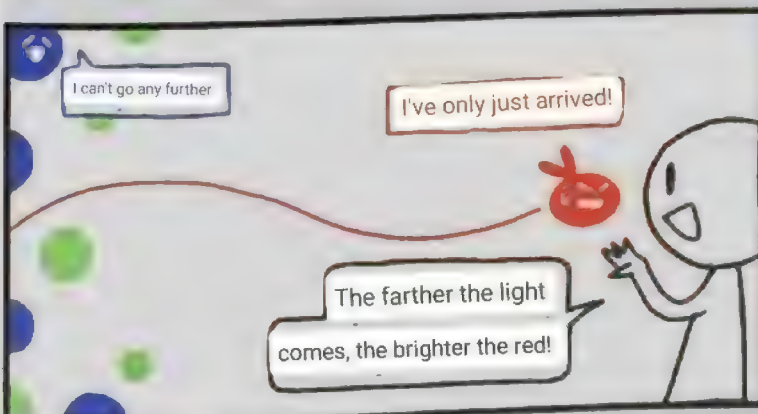
1) Leylaic acid: When electromagnetic waves pass through a gas, transparent liquid, or solid, they are elastically scattered by small particles

When the wavelength passes through the particle, if the particle is equal to or greater than the wavelength, when the light passes through the dust, the dust scatters all the light. Electromagnetic waves, including light, have wave properties, and are classified into short wavelengths and long wavelengths according to the length of the wavelength

"Is this a non-scattering?!"
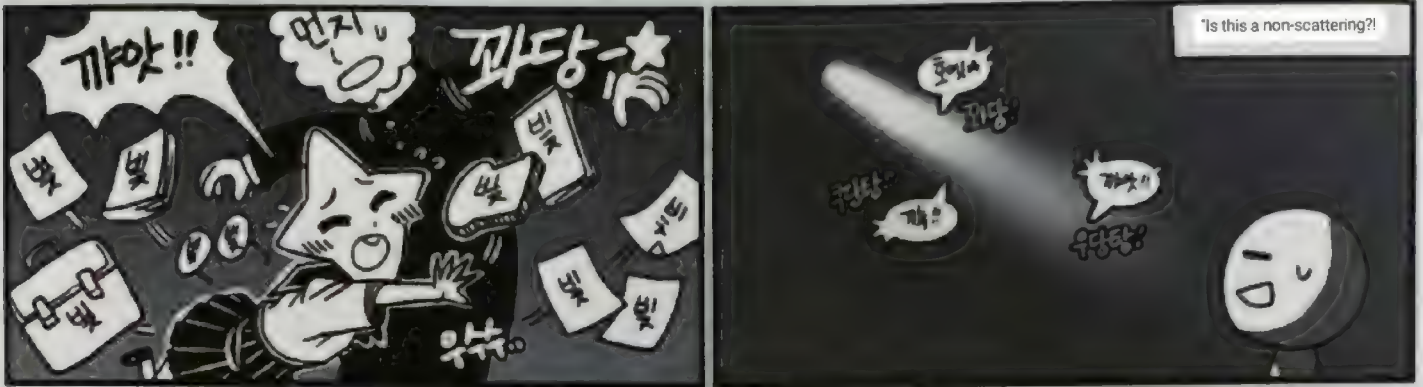
The more particles such as dust or moisture in the air, the more scattered light interferes with other wavelengths.

Objects may be perceived as having different colors depending on the condition of the atmosphere surrounding the object or the distance between the object and the observer

The farther away, the more scattering...!

Project as I am!

Light sources, highlights and shadows, that is, all the light becomes obscured

nearness

far

The longer the observation distance and the thicker the atmosphere, the more certain this phenomenon is

Leonardo da Vinci applied the stumato technique, which blurs the color and shape of an image, to his paintings.

Can't you see the shape and color?

It's a bit blue...

"Wow... that's really cool...

It seems so far away.

Cloudy and foggy..

[Like smoke!! [

Sfumato technique

2. Atmospheric Perspective. An expression of the sense of distance by reproducing the phenomenon in which distant objects appear blurred according to the density of air
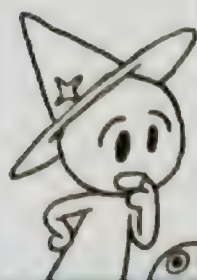
Let's look at an example of indirect light

and summarize it once more!

You can observe the difference

in illuminance 1 learned earlier.

The list is illuminated with moderate illumination

The color of the object is well represented

- The sky is acting as an ambient

light and is illuminating the shadows blue

The ambient light illuminates the object very widely,

so the shadows caused by the ambient light are very dim.

+ Even a white object

appears darker than the sky, which is the

light source of the environment.

. The color of the object does not appear

well in the list because the illuminance of sunlight is

very high outdoors in the middle of the day on a clear day. The color

of the object is displayed well in the shadows and in the borders of

light and dark with relatively low illumination

The sky is also

very bright due to the sun, and the

illuminance with the

environment reflected in

the shadows is also increased

· The main light

source also brightly illuminates

the floor, so the reflected

light from

the floor was also clear.

· Closed shadows appear where even

indirect light cannot shine.

- Observe that objects of the same color appear as distinctly different colors by the light source.

Observation is paramount

situation A

The illuminance of the main light source is

moderate, but the inter-wavelength is very strong.
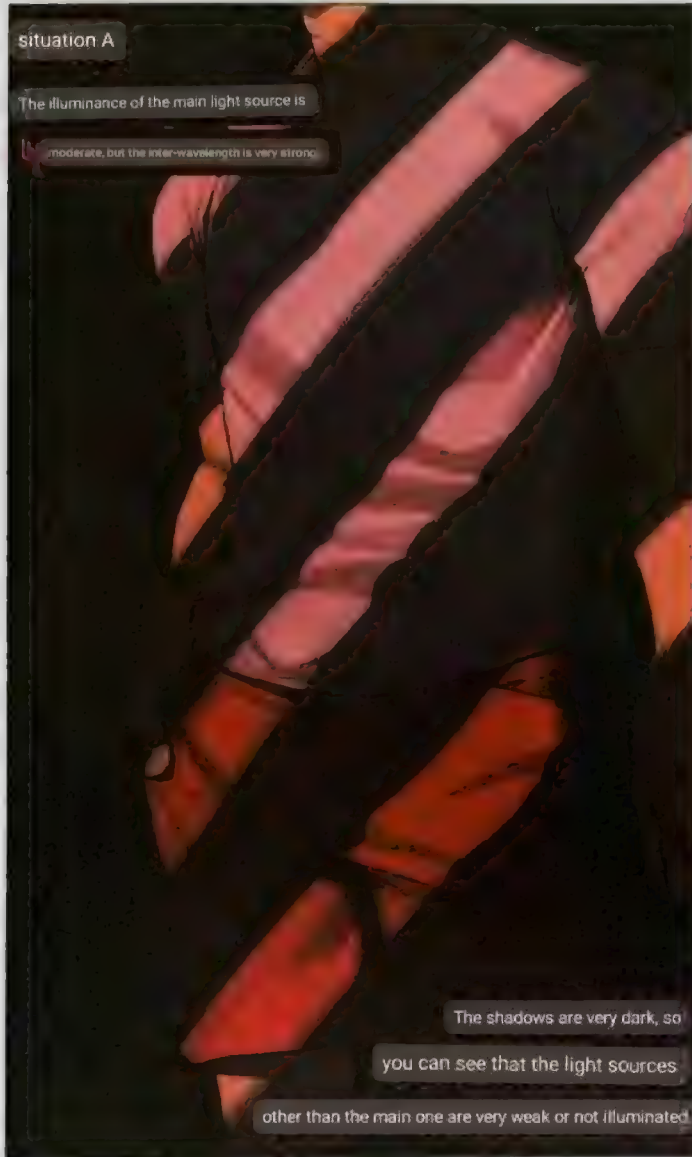
The shadows are very dark, so
you can see that the light sources
other than the main one are very weak or not illuminated.

situation B

The illuminance of the main

light source is too

high, so the color of the object is

difficult to see in the highlights.

•The illuminance of the environment
hall illuminating the shadow is relatively
moderate, but the blue wavelength
is strong, so the shadow of the object is blue.

original color · A · B

- Even if the color of an object appears different due to light

The brain automatically corrects it and recognizes it as the original color. The

color correction of the brain is greatly affected by the color of the surrounding

environment, so for natural coloring, the expression of light must be properly painted over the entire picture

You can't fool me later!
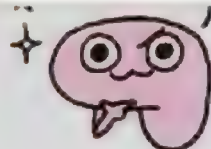
I need a hint for color correction!!
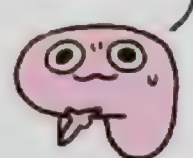
Practicing Passing Objects to Photos

In the real world, various lights illuminate the world. Let's infer the light from the color of the object, and color the object according to the analyzed light

Wouldn't it be too difficult for a beginner?

Should I observe?

A place simpler than you think!
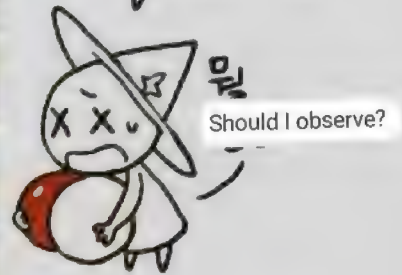
Finding a hint of light through the color of an object

This is the purpose of practice.

① The light of the main light source

[Red bricks turn orange,

Brighter than the original green color

The light from the main light source can be inferred by the color of the highlight where the object is directly lit. The red bricks appear somewhat orange (color of light), and the green leaves are brighter than their original color (illuminance)

② Light of indirect light

reflected in the window

I can see it even in the shadows

The color of the sky'

An achromatic object turns blue
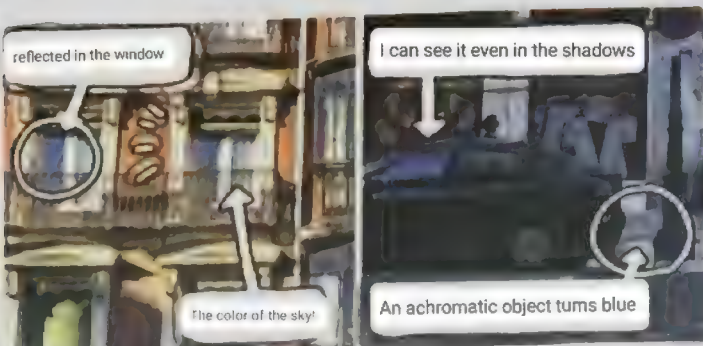
Indirect light, especially ambient light, does not have a clear incident direction

The color of the overall shadow

or the light reflected off a smooth object is a hint.

In the photo, a blue ambient light is shining.
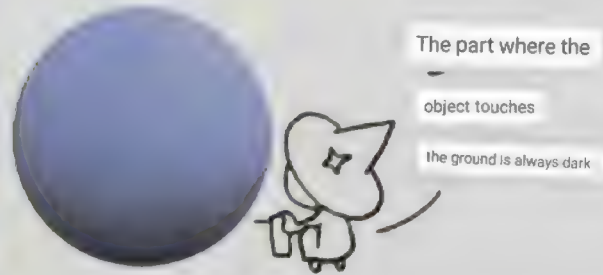
light that shines differently over time

Let's observe the changes in the light of the sun and sky over time and find out what changes in the color and illuminance of the light.

day

This is when the sun, the brightest light source in nature, is at its brightest. The illuminance of the main light source is very high, and the indirect light also has vivid colors. The contrast between the highlights and shadows is very clear, and depending on the direction, a color with higher saturation can be used in the shadows than in the highlights.

① color

This is the time when the color of lower objects is best. Because the sun is almost white light, there is little change in hue in the highlights. On the other hand, the shadow has a large color change because the blue ambient light is added vividly.

② Saturation

Just like adjusting the exposure value on a camera, you can color by desaturating the colors that appear in the highlights and increasing the saturation of the shadows or contrasting borders.

3 Shadow

The contrast of the shadows created by the main light source is very high, and the three-dimensional effect stands out, and the shadows of the ambient light that cast the shadows have a low contrast.

strong illuminance

The indirect light illuminating the shadows is also strong!

Points to note

Shape shadows and shades do not overlap.
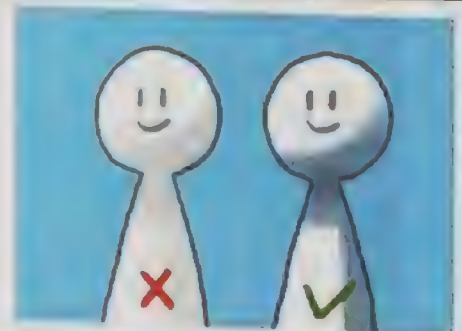
Shadows appear darker than the ambient light source (the sky).

In the shadows, the overall blue ambient light is shining. A clear day's sky is indirect light, but it's illuminating enough to illuminate objects.

-Sunlight with a suitable illuminance increases the brightness and saturation of the object appropriately and gives it a slightly series color.

The light (luminance) reflected from a distant object is more blue than a nearby object because it is greatly influenced by the blue environment.

Sunset, Sunrise

It is also called golden hour

At sunset and at sunrise, the sunlight passes through the thick atmosphere and becomes reddish. Under the influence

of the main red light source and the blue environment, the intrinsic color of the object does not appear well, but a very colorful color change can be observed

DRINOTUNA

① color

As the sun's illuminance decreases, only red wavelengths remain. It is a moderate illuminance to brighten the highlights, but the warm colors stand out clearly

The sky, on the other hand, subtly illuminates the blue ambient light. In highlights and shadows, there is strong contrast as well as clear color contrast

2

The red wavelength incident on the bright spot strongly increases the saturation of all colors except for green-cyan type objects

Brightness

Compared to the daytime, the illuminance of the main light source is lowered, and the brightness of the highlights is increased appropriately. The main light source is dimmed, so all indirect light is less affected

skin   dress   ⇒   skin

warm light

Slightly

weakened

indirect light

Points to note

S50

S25

540

This often happens when mixing plants

The contrast between highlights

and shadows can be weakened by paying attention to color differences

When coloring a chromatic object, the color saturation

is Highlight > Contrast boundary) Shadow.
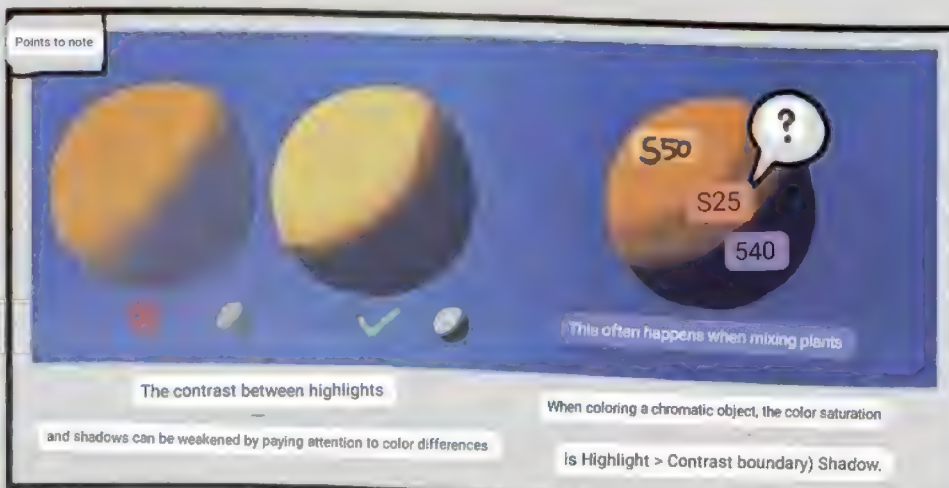
The afternoon sunlight is enough to illuminate the object, but the color of the object may change slightly because the warm color wavelength is stronger than the midday light.

All indirect light is dimmed, so the shadows are darker than in the middle of the day

Because the ambient light shining on the shadow has a blue color

The contrast of warm colors and cold colors appears along

with the clear leader of the highlights and shadows.

twilight (twilight)

When the sun goes down, the strong main light source, the sun light, disappears, and only the wide sky exists as a light source of weak ambient light. Since the light from nature is very weak, the effect of other artificial lighting is clearly visible on the object

① color

Only the effect of the blue sky affects the object widely, so the blue color appears throughout the object.

In particular, it can be observed that a clear blue color appears in an achromatic color, especially a white object

2. Saturation

It is desaturated because it is not illuminating enough to evenly illuminate the object. In particular, the yellow color appears very low in saturation 3)

Brightness

Except for objects that emit light by themselves and objects illuminated by artificial lighting, all objects appear darker than the sky, which is the light source of ambient light. The light of the sky without the sun lasts only a very short time, so everything goes black in an instant.

Only the ambient light shines

The shape of the shadows are blurry and dark!

In ambient light, the direction of the light is unclear, so the shadows do not appear clearly.

When ambient light is the main light source, the light becomes weaker
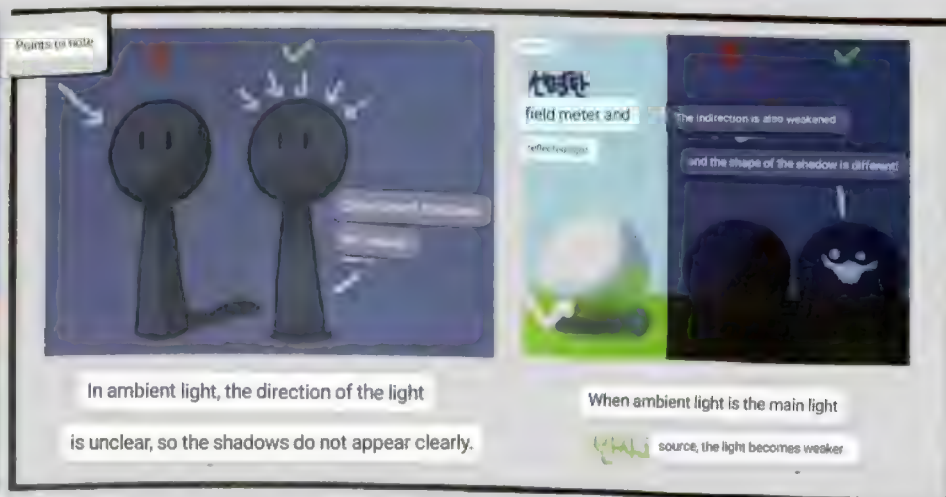
Natural light after sunset

The sky becomes the main light

source. Therefore, colors lighter than the sky do not appear.

The illuminance of the sky, which is the ambient light,

is very low, and the direction of the light is

not clear, so the shadows created by

the ambient light are very blurry.

At this time, if there is bright artificial

lighting, the presence is very prominent.

midnight

The relatively dark moonlight appears at midnight when even the sky is dark. Since the

moonlight is also indirect light reflected from the sun, the illuminance is very low, and starlight cannot be regarded as a meaningful light source

1 colour

Because moonlight is indirect light and the illuminance is very low, only bright colors such as white stand out, while other colors look very dark

The moonlight itself is white light like the sun, but depending on the direction, it is expressed in blue to show contrast with the warm sunlight.

2 saturation

Along with the lightness, the saturation is also very low, and the saturation change of the yellow series is large

3 people

Moonlight is not illuminating enough to illuminate objects. If there is a light source with a stronger illuminance than the moonlight, the color change due to it is clearly

visible. In the absence of artificial lighting, the object should be darker than the night sky.
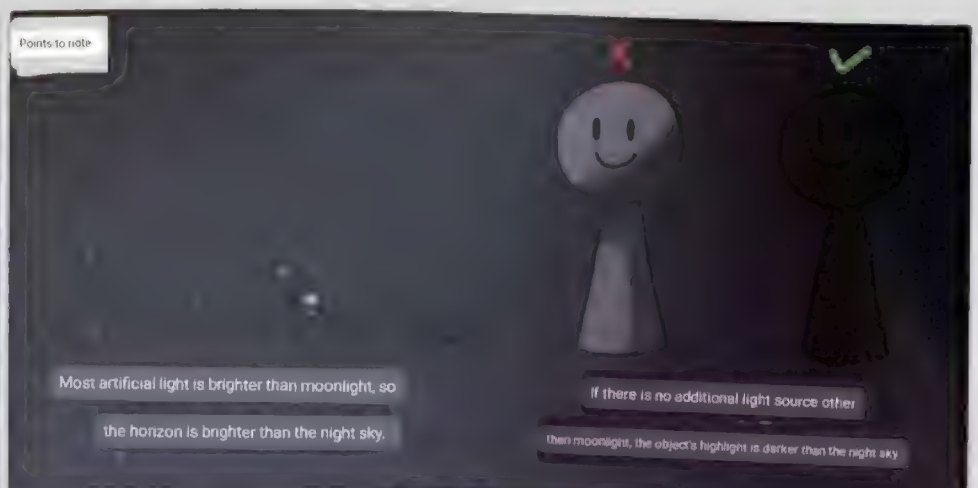
Starlight is too small and weak to be used as a valid light source.

The moonlight does not illuminate objects sufficiently because the light intensity is weak.

If a color brighter than the night sky appears on an object, it means that there is a light source other than moonlight.

Changes in light and color depending on the weather

learn the strength and weakness relationship between light sources that change
weather and express them easily using the layer

Sunny

indirect light

The sky is bright enough, but definitely weaker than the sun, which is the main light source. (Main light source> Indirect light)

Colors appear well on the highlights of the object. •A little warm color is added.

Since the indirect light is very bright,

the shadows are on the lighter side,

but the color of the indirect light is also calculated clearly.

Since the sun, the main light source, is a point light, the boundary between the shape shadow and the shade is clearly displayed.

Lighting in which a small-sized light source illuminates the light in a certain direction

In clear weather, the illuminance, color, and incident method of the main light source and the ambient light are clearly distinguished, so it is used as the most common natural light production. However, because the contrast between the highlights and shadows is very clear, the detailed description of objects is often omitted. Colors and contrasts created by different types of light are the subjects, so you can express various colors throughout the object

Overlay
70%

multiply
80%

Overlay
30%

simple synthesis

Draws sharp boundaries between highlights and shadows

Add a little warm color while increasing the saturation by overlaying light gray brown on the highlights, and multiplying the shadows multiplying the light blue to lower the brightness and give it a blue color.

You can express the reflected light from the ground by gently painting the color of the delay from the floor and adding it with an overlay compositing

blur

ambient light

main light

As the sun's rays passed through the clouds, the illuminance decreased. (Main light source> Indirect light)

Rayleigh scattering does not **occur well in a sky with too high** humidity. It is not blue in color.

Because the main light source is spread widely and illuminates evenly, the contrast boundary appears blurred.

*As the illuminance of the main light source is lowered, "The reflected light has become very weak

Sunlight shining through an overcast sky diffuses the direction of the light, dimming it a bit, and showing the boundaries of soft shadows. In the sky, the illuminance of ambient light is determined by the thickness of the clouds, and moisture in the air causes mass scattering, so it does not appear blue

The contrast between the objects is weakened and the three-dimensional effect is reduced, but the natural light shows the appearance and color of the object evenly. The colors created by the light are rather easy, but you can see the shape of the object most accurately, so it is often seen in portraits, etc.

multiply
by 100%

simple synthesis

Contrast boundaries are softly expressed

The list appears without any special color change

The shadows are multiplied by color and combined to lower the brightness a little without changing the color. Adjust the opacity so the contrast isn't too high.

Since the illuminance of the main light source is rather weak, the indirect light

rain

(시안시)

The sun is completely obscured by the clouds and cannot directly illuminate the object.

A cloud with the sun (the sky) becomes the light source

·It illuminates the object very weakly and widely

Objects appear dark and less saturated.

Because the direction of the light is unclear, the shape shadow disappears and only the closed Sony shadow appears

When an object becomes wet and shiny

The color of the object is darker, but it reflects the reflected light well
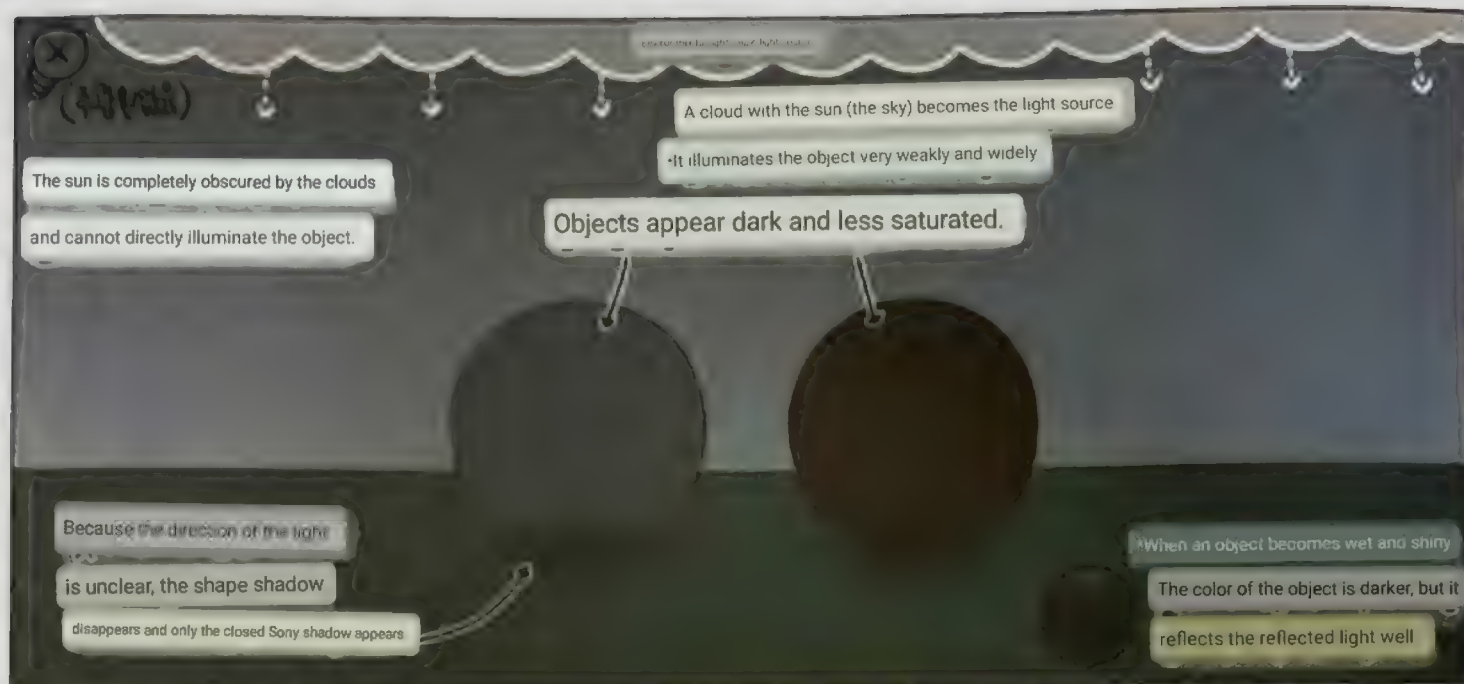
The clouds are so thick that the sun, the main light source, cannot directly illuminate the object, and only the sky, which is indirect light, illuminates the object weakly and broadly. The direction of the light is too wide, so no clear shadows appear, and the color of the object appears dark due to the low illuminance of the light source. When an object gets wet from the rain and becomes glossy, it becomes darker, reflecting the reflected light, making the appearance of the object less clear. For the above reasons, weather is usually avoided in photos and drawings, and a specific dark atmosphere can be used to create a specific situation

Artificial lighting is very noticeable.

① Excluding

50%

② Multiply

by 100%
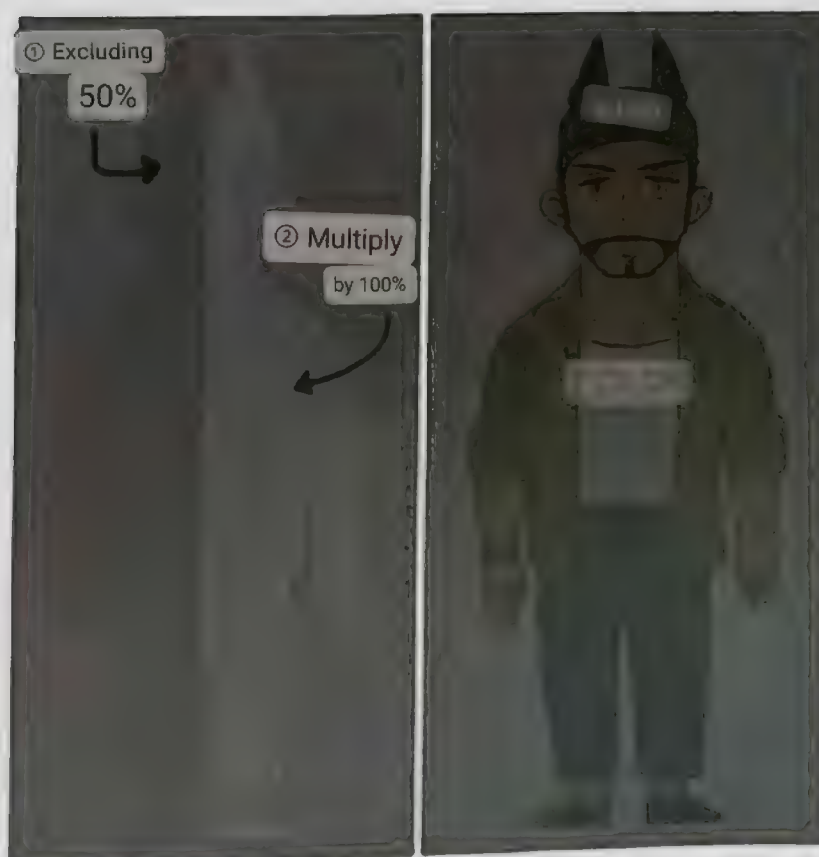
simple synthesis

In rainy weather, only closed shadows appear, so it is natural without special shadows.

① Contrast between highlights and shadows is greatly reduced if all objects are combined except dark gray. ②

Lower the brightness of the picture by multiplying and compositing it with gray

The object should be much darker than the color of the sky, and the wet or shiny object will have a lower brightness.

snow (yellow dust)

The snowy sky appears bright white due to the non-scattering phenomenon. The ambient light illuminance is as high as the main light source. (main light source = indirect light)

main light

source (diffuse)

As the sun passes through the clouds, it diffuses and dims a bit.

The colors show up well in the roster.

The further away the object is, the better.

All shadows except closed shadows are extremely blurred because the contrast boundary is blurred by the diffused main light source and the indirect light brightens the shadows.

*The reflected light from other objects is also bright, but there are few shadows from the reflected light, so it cannot be observed well in reality.

Under the influence of the white sun, sky, and snow field, the illuminance, color, and incident method of the main and indirect light illuminating the object are almost identical. If the illuminance is sufficient, the object has a vivid color without shadow, and only the color change due to perspective is observed well. A similar appearance can be seen in the weather of yellow sand, where sand dust is thick instead of snow in the air, and the color of the sand affects the environment as a whole. You can observe the shape and color of the object well, but it is not often used outdoors because it is not natural light in a general situation

KIND

COLOR

KIND

COLOR
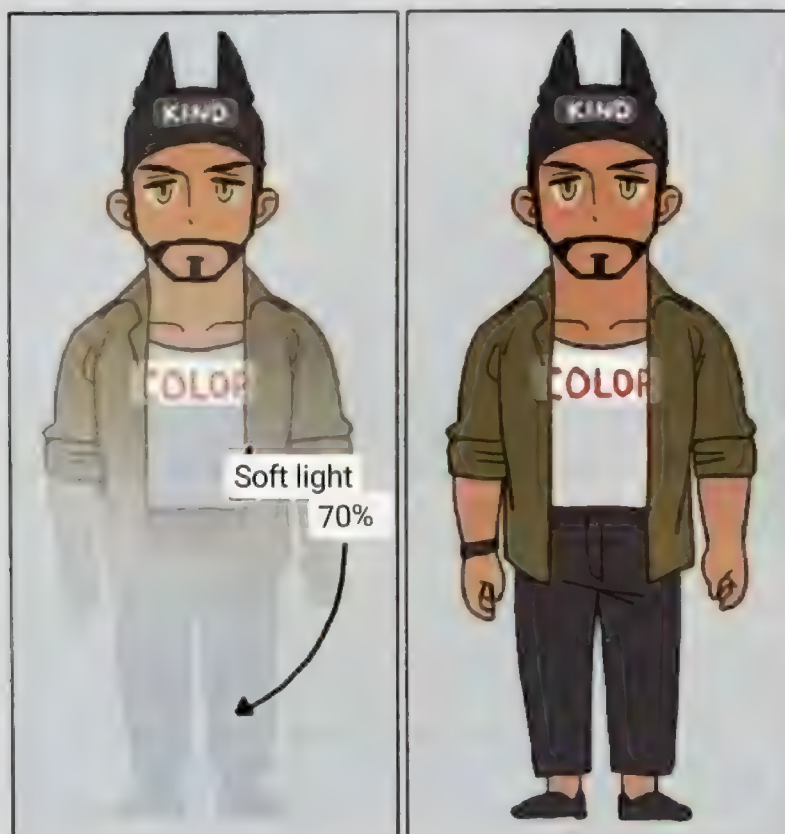
Soft light
70%

simple synthesis

Indirect light that casts shadows appears as bright as the main light source, so it looks natural without sharp shadows

The closer to the snow field, the higher the illuminance of the reflected light, so soft light is synthesized with light gray on the floor to create the effect of illuminating the lower part of the object with indirect light

Lighting conditions are almost the same even in yellow sand, so soft light is synthesized with sand color instead of light gray.

Comparison of light and color according to location

Let's find out how the color of the light changes depending on the location and the properties of the object in its own and difference.

Natural light ↔ Indoor lighting

↙ ↓ ↓ ↓ ↘ bright ambient light

very bright daylight

clear reflected light

natural light

The sun, nature's only light source, has a slight warm

color, and the sky brightened by the sun has a vivid blue color

The colors of the sun and sky affect the color of objects somewhat

The illuminance of the main light source is very high, so all objects shine

strongly, and reflected light from other objects is also clearly visible.

When an opaque object appears translucent due to strong illumination

Also, light passing through an object creates a new color.

|What is diffuse descending oviposition? 108P›

Main light source with sufficient illuminance

dim reflected light

indoor lighting

Artificial light, or room light coming in through windows, is

often purer white than the sun. White light only affects

the brightness and saturation of an object depending on the illuminance

The illuminance of a light source that is weak compared to the sun is sufficient to illuminate the

object, but indirect light such as reflected light does not appear well

The material of the object, especially the texture of the surface, is well revealed

light source color		표	Etc
natural light	Warm color close to white + sky blue	Very strong main light + distinct indirect light	Emphasize material permeability
indoor lighting	It looks pure white.	Moderately lit main light + dim indirect light	surface texture highlight

mood lighting ↔ neon sign

warm color wave

mood lighting

Because mood lighting installed indoors has a large proportion of warm color wavelengths, warm colors appear well on the bright side of objects

object color in the list

(Multiply Composite)

Compared to general white light, the wavelength is not uniform, so the illuminance of the main light source that illuminates the highlights is somewhat lower. When only a light source of a certain color illuminates the room, the ambient light of the same color as the light source appears

neon sign

Unlike mood lighting, neon signs have a very strong monochromatic wavelength

In this case, the object appears in one color regardless of its intrinsic color.

object color in the list

(Multiply Composite)

Intense color and saturation have the effect of increasing illumination,

but the more vivid the color of the light source, the weaker the energy

compared to white. Therefore, the value of the object appears low

Objects of the same color as the light source are difficult to distinguish from white in this light. Conversely, objects of complementary color appear black

	light source color	do	Etc
mood lighting	light of a specific color (🔴)	Low illuminance compared to white	The degree to which the color of an object is warm
neon sign	• Light with only a specific color ((🌓)	Vivid saturation, but low actual illuminance	Regardless of the color of the object, only the color of the light source appears

For reference, the value of the white object in the two light images is darker when it is a neon sign. 🔴 = ⚫⚫
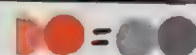
In the bush ↔ in the water

The light that penetrates the water is green due to the effect of the color of the plants. As light passes through a thicker object, its direction is scattered and the illuminance decreases. As the light shining on the object is weakened, the colors we observe also become darker

The color of the light changes and the illuminance decreases!

dark and green?
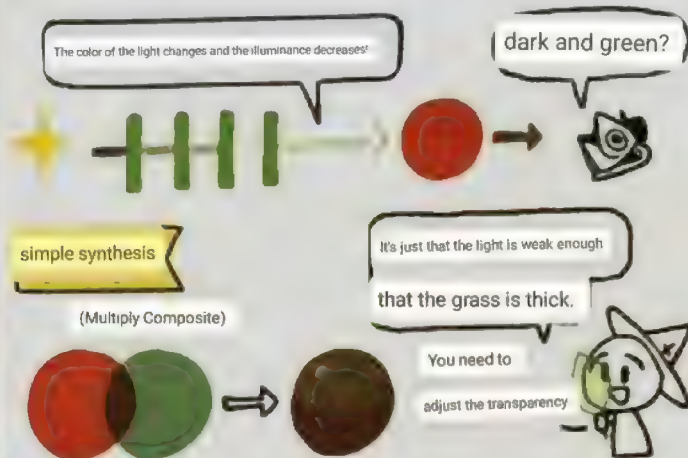
simple synthesis

(Multiply Composite)

It's just that the light is weak enough that the grass is thick.

You need to adjust the transparency

underwater

Deep water turns blue due to light scattering. The intensity of light reflected from an object and reaching the eye is called luminance. (After) The luminance is affected by the space between the object and the eye independently of the light source, and in a space such as water, the luminance decreases along with the illuminance

Light reflected from objects, reduced luminance + added blue light!

Blue and cloudy
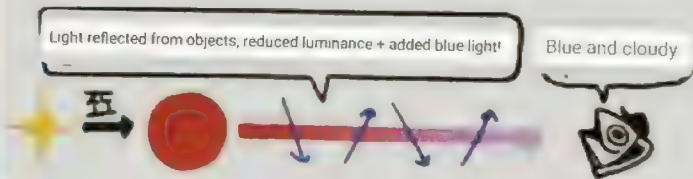
Dark shadows are also affected by blue light scattered in the water, which makes the shadows bluish and reduces the contrast with highlights. This phenomenon also occurs in air.

	light source color	tone/luminance	Etc
in the bush	Green (plant color)	The light incident on the object is low.	
underwater	the light goes out through the water in sequence	The light reflected by the eyes the luminance is low	Added blue light to the shadow as the luminance is lowered. Reduced contrast

The back canal is often referred to in air perspective.

PART 03

light

HERE ON

1_Lighting

The difference between the color and illuminance of the light source affects the display of the object's color, but does not fundamentally change the appearance of the object's highlights and shadows.

However, depending on the lighting method and direction of the light source, the shape of the highlight, shadow, and contrast boundary changes, so the appearance of the object may look different depending on the lighting.

1. What is lighting?

The act or function of illuminating a place for a certain purpose is called lighting in photography.

Because painting and photography have something in common that different types of light create color, understanding the lighting that photography deals with will help you with coloration.

main name

auxiliary lighting

If you set the light source well, you can capture the look you want!!!

Light sources like ours act as lighting.

I'm Joo Jod's name~

I Joo Kwang won

"I am an auxiliary light~
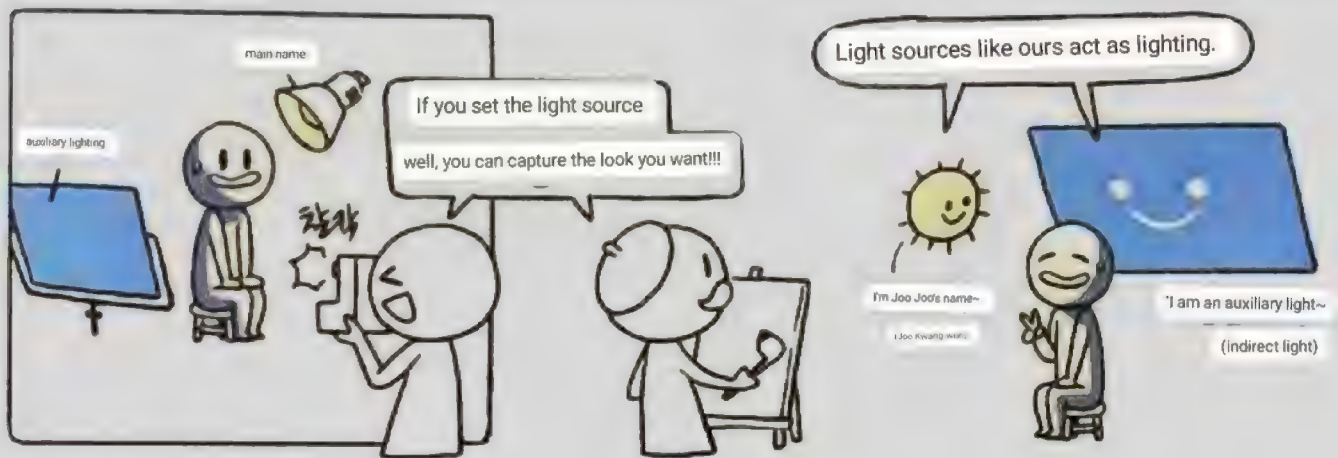
(indirect light)

1-1 Classification according to survey method

① Spotlight Light source is

small in size and intensively illuminates a specific part of an object in a certain direction.

The shape of the shadow is very distinct, so the direction of the light is intuitive.

There is a clear distinction between the lit areas and the non-illuminated areas

Clear light direction!

Therefore, the boundary between the light and shadow and the contrast boundary are very clear

There is a feature that all but the list are invisible.

Give me the light.
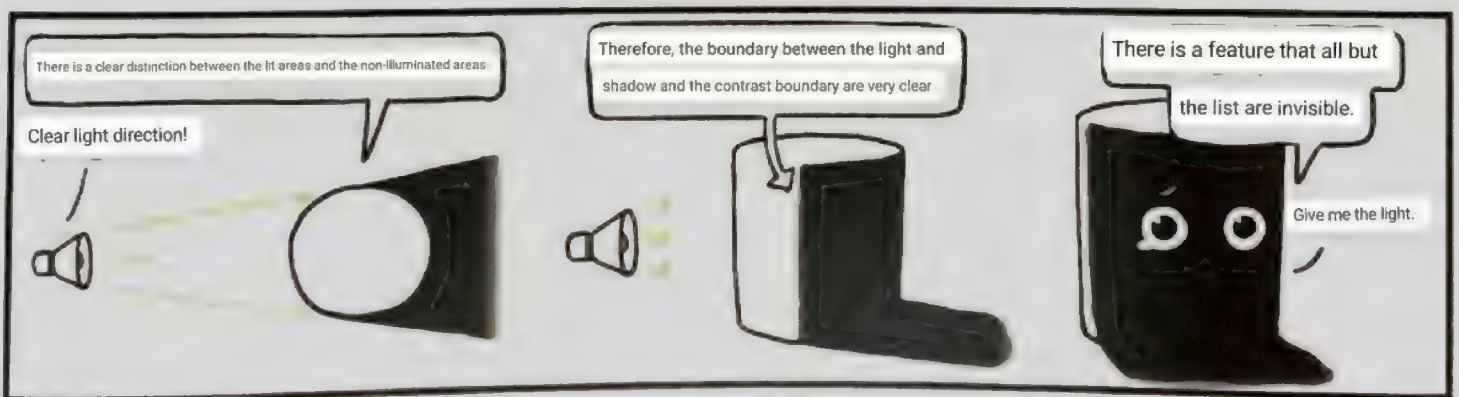
A typical point lighting is such an example.

candlelight

the size of the light source

stage lighting

Light direction is constant

'The sun is originally a divergent light'

Because it is so far away from Earth, it acts as a kind of spotlight.

15,000,000km
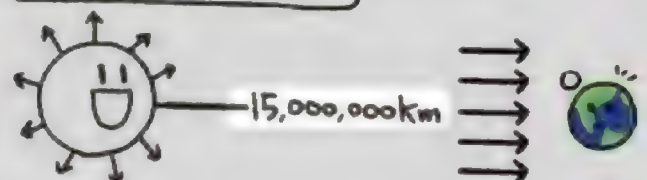
2 diffused light

It is a light that projects light in a wide direction to illuminate the object evenly across the object.

Compared to point lighting, it shows a softer border between light and dark, so it can represent the three-dimensional shape of an object well

> The distinction between highlights and shadows is relatively unclear.

> depending on the surface curvature of the object)

> The difference in contrast is variously displayed.

> It is possible to express the three-dimensional effect in detail by making a difference in the shape of the shadow

> sure to get

> | dark!

> 'Slightly bright

> The basics of shape description!
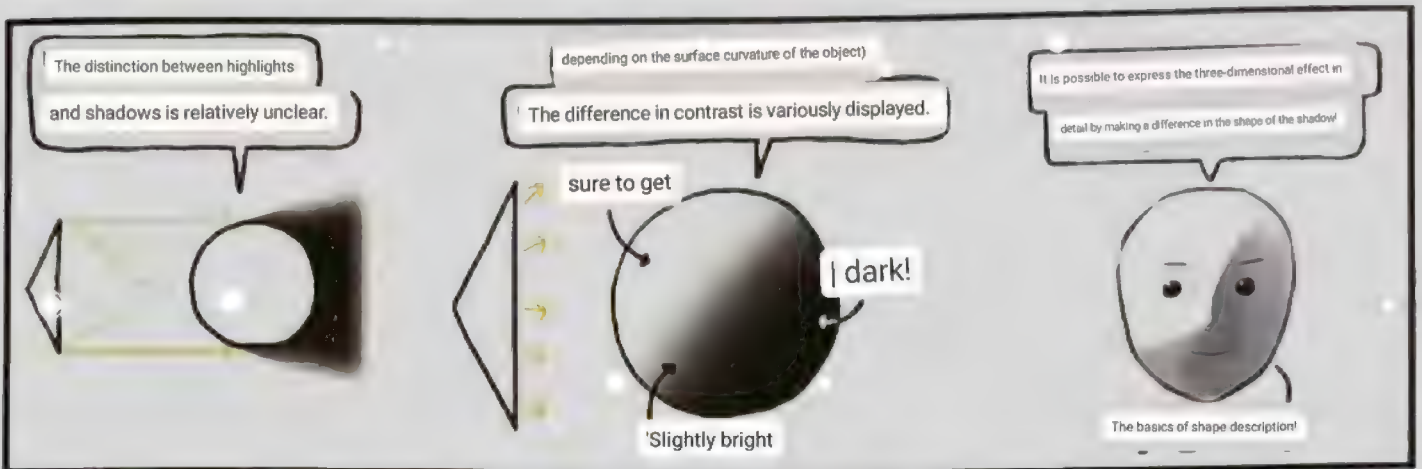
A typical diffuse lighting is such an example.

> studio lighting]

> Because the shape of the object must be clearly visible!!

> 오드/흐끼드

> I need to

> brighten up the space...

> 오네터

> The light source jumps the shape of the face.

③ Fill light

A light that illuminates an object from a very wide direction. In nature, an environment such as the sky acts similarly to auxiliary lighting. It is mainly used to light shadows created by point lighting or diffuse lighting, and weakens the contrast of light and dark.

> As the light direction is wide, the shadows are not well exposed.

> Only closed shadows by shielding

> [You can observe.]

> maybe... my god V full of light...

> Because the shadows are not clear, it is difficult to describe the three-dimensional effect, so it is not suitable as a main name.

> shadows caused by other lighting

> It is used for clarification.
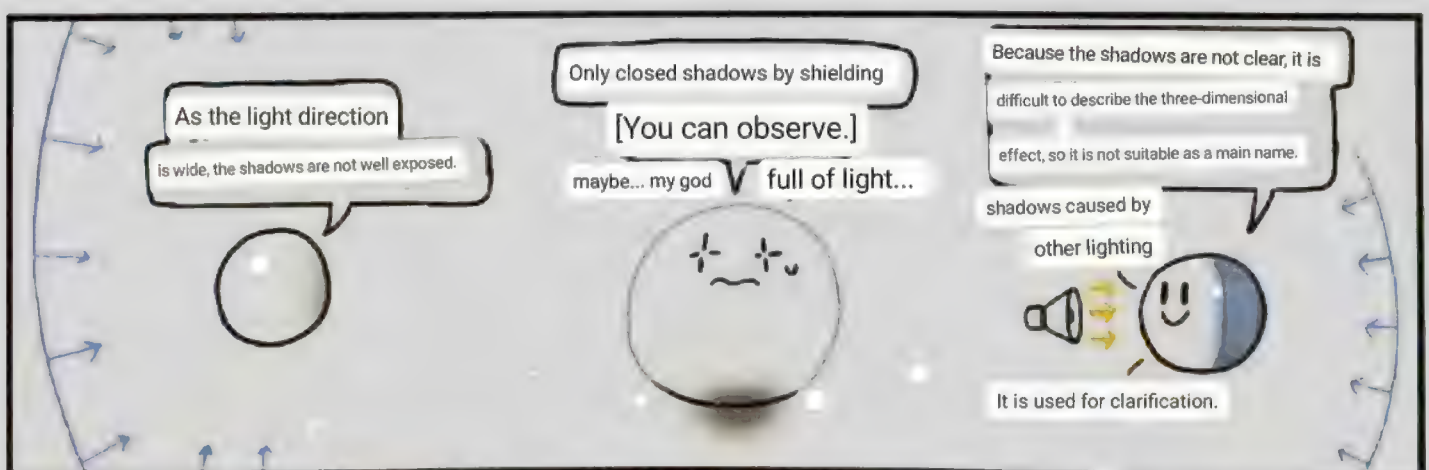
A typical auxiliary lighting is such an example.

> 흐느 아늬

> The illuminance of the midday sky is good for auxiliary lighting

> bush | It spreads the light of the sun (point lighting) widely.

> background reflected light

> A large area of reflected light acts as an auxiliary light!
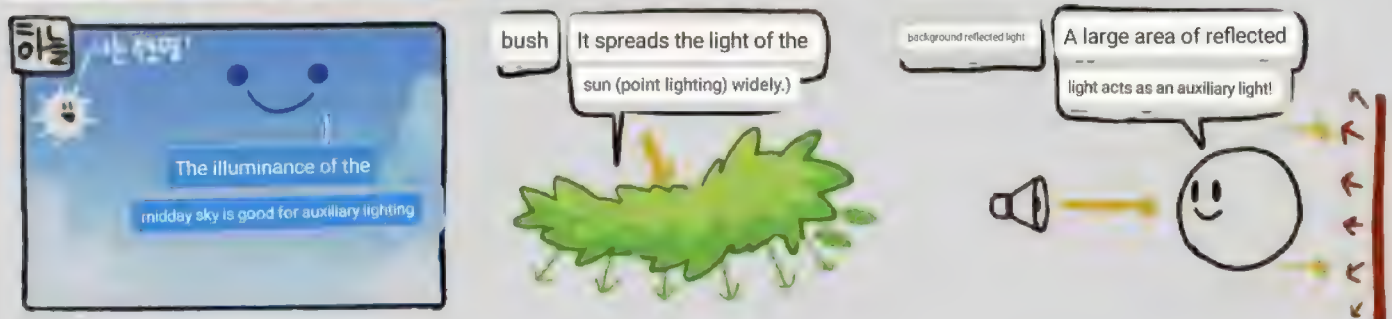
1-2 Classification according to the number of lights

There is no change in the lighting method, but the shapes of shadows or contrast borders are classified according to the number of lights.

① In case of illuminating only 'Keylight' - 1 point light

. Lights that create major shadows in three

spotlight

The contrast between highlights and shadows is extreme, and the shadows become complete darkness for a dramatic effect.

The contrast created by the name of the master can be seen very clearly!

It looks like the light direction is good!

[In addition to the main light, indirect light such as reflected light can be projected widely separately from the light

diffuse lighting

Contrast borders appear softly, revealing three-dimensionality and detailed structures.

Contrast borders appear abundantly ·It definitely shows a three-dimensional effect!

It seems like it would be suitable for a body profile picture
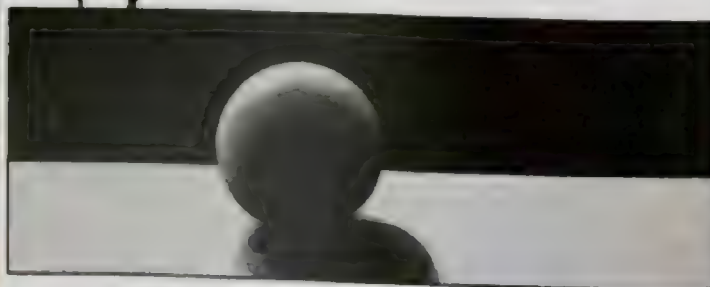
(However, the dramatic effect is weak because the direction of the light does not appear well.
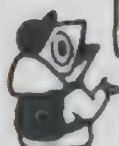
This is a versatile light.

When illuminating an object with one light, the shadows are too dark to reveal the overall appearance of the object.

In photography, two or more lights are used to illuminate objects. Also in nature, one-point lighting is not universal.

2 When other light sources such as auxiliary lights are illuminating together - two-point lighting

If the illuminance of the main name is stronger than the auxiliary

light, it can be expressed that there is a light source that properly reveals the light direction when the diffuse light is additionally illuminated in the shadow.

Even in the same type of lighting, depending on the role, it can be classified as a /auxiliary lighting!
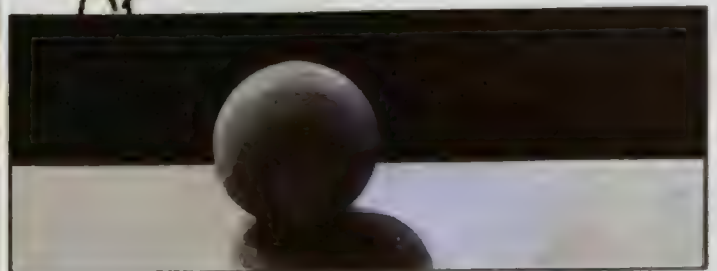
Since there are multiple light directions, shadows may appear overlapping.

By illuminating the area of the shadow that the main name could not cast with a wide auxiliary light, you can naturally illuminate the overall appearance of the object

If the shadow area that the main name's light doesn't reach doesn't appear black, it means there's an auxiliary light! Still, closed shadows are still dark!
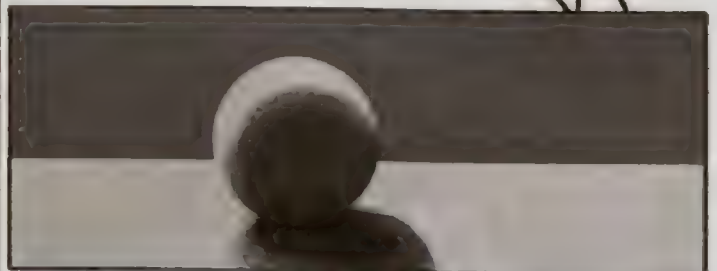
This is the most common lighting. It is similar to the relationship between the midday sun and the sky. "The most familiar sight to our eyes.

When the illuminance of the main name and the auxiliary light is

similar, if the illuminance of the two lights is almost the same, it is difficult to distinguish between the highlight and the shadow

In the 'Double color lighting technique, colorful shadows can be created by illuminating the shadows created by the main name with clear lighting. Areas where two lights overlap and incident become brighter, and areas where neither light shines nor closed shadows become black.

At first glance, the contrast between the colors of the highlights and shadows is similar to the light of the setting sun, but the major difference is that the illuminance of the two lights should be approximately the same.

TMI♥ white-out

On a cloudy day, the illuminance and color of the main light source, reflected light, and ambient light become the same, a phenomenon called whiteout appears, and all shadows except closed shadows disappear, making it impossible to determine the perspective of the space

33 point lights

main name)

backlight

auxiliary lighting

In an environment where the main name and auxiliary lighting are all together

A technique for distinguishing objects from the background by shining light on the edges of the objects.

It's called three-point lighting

The three-point lighting technique, in which each light is installed according to its role, can effectively distinguish the subject from the background, so it is a basic lighting technique used in photography and painting.

2 Illumination terms used in the figure

As mentioned earlier, photography and painting share a number of things in common in terms of dealing with

lighting. Using character illustration as an example, let's find out what lighting terms are used and what role they play

Highlight

It is the part that shines brightly

by the main name, especially the brightest

part. Depending on the material of the object, it

may have a clear shape, which is called Specular.

Rimlight A distinct light shines on

the outlines of an object to accentuate the

silhouette and separate it from the background.

·Reflected light Light reflected from an object

or space around it is additionally

projected onto the object. The degree

of reflection varies depending on the material.

*Ambient light does not appear clearly on the object,

but it does affect the brightness and color of the shadow.

The names of the lights in the pictures

may differ depending on the coloring style!

2. Lights and Shadows

In order to reproduce the three-dimensional shape of an object on a flat space, the shape of the shadow produced by the light source is very important

Even if there are objects in three-dimensional space.

We observe a object on a two-dimensional screen.[

[In order to perceive the three-dimensional effect with the eyes, it is necessary to distinguish between Yeongam and Yeongam]

if there is light

Could be a hint...
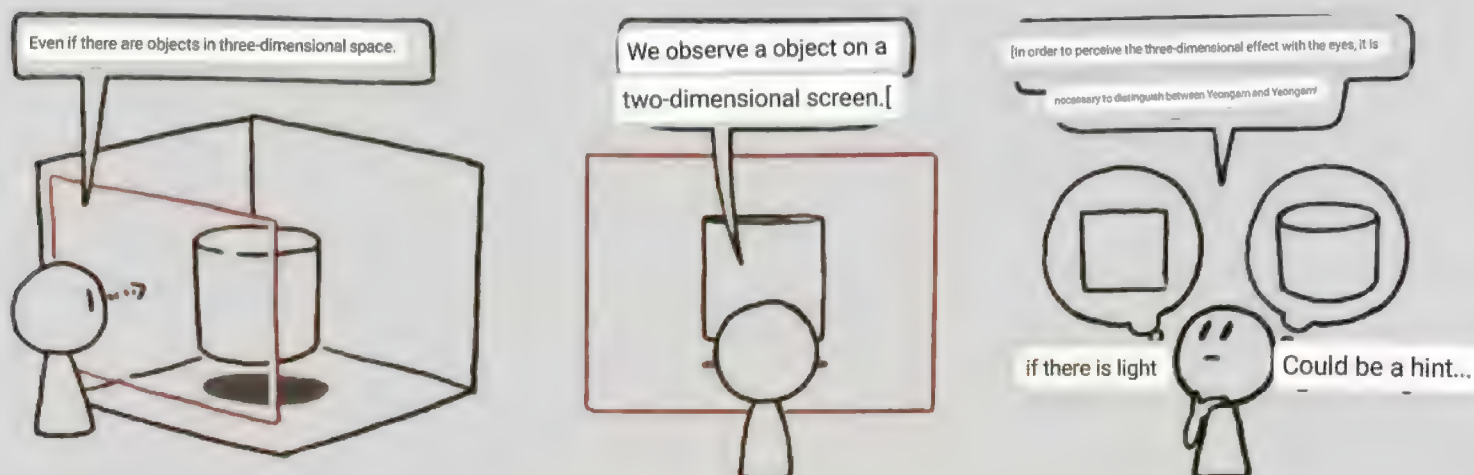
2-1. Factors affecting the appearance of shadows

First of all, in the same lighting direction, the shape of the shadow and the gradation of the contrast boundary' appear differently depending on the kurtosis of the shape

→ 명함 shadow

The roughness gradually decreases along the smooth curves.

according to the structure

The kurtosis of the edges may be different

Sometimes the kurtosis changes gradually.

→

Based on the edge, the 'border of light and dark is clearly distinguished.
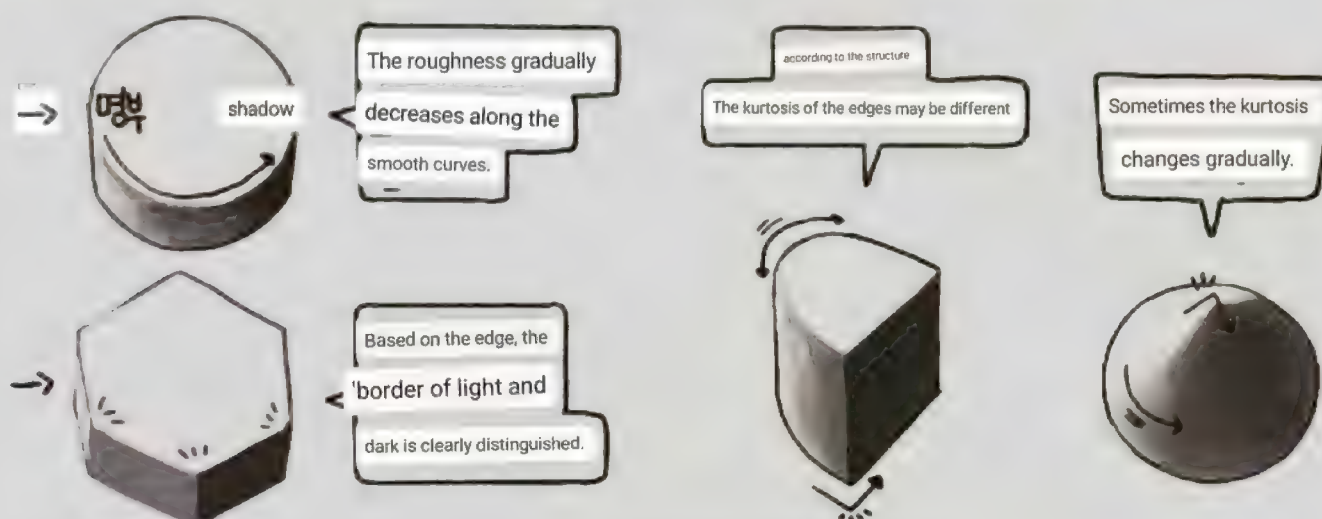
Also, as noted earlier, the gradation of the contrast boundary appears differently depending on the illumination method

The smaller the lighting and the clearer the direction of the light, the clearer the contrast and the clearer the border.

List!!>

shadow!!

Lights that shine in a wide direction like volcanic lights appear softly on the [Young-Am boundary].

Neither the list nor the shadows are "like.

??
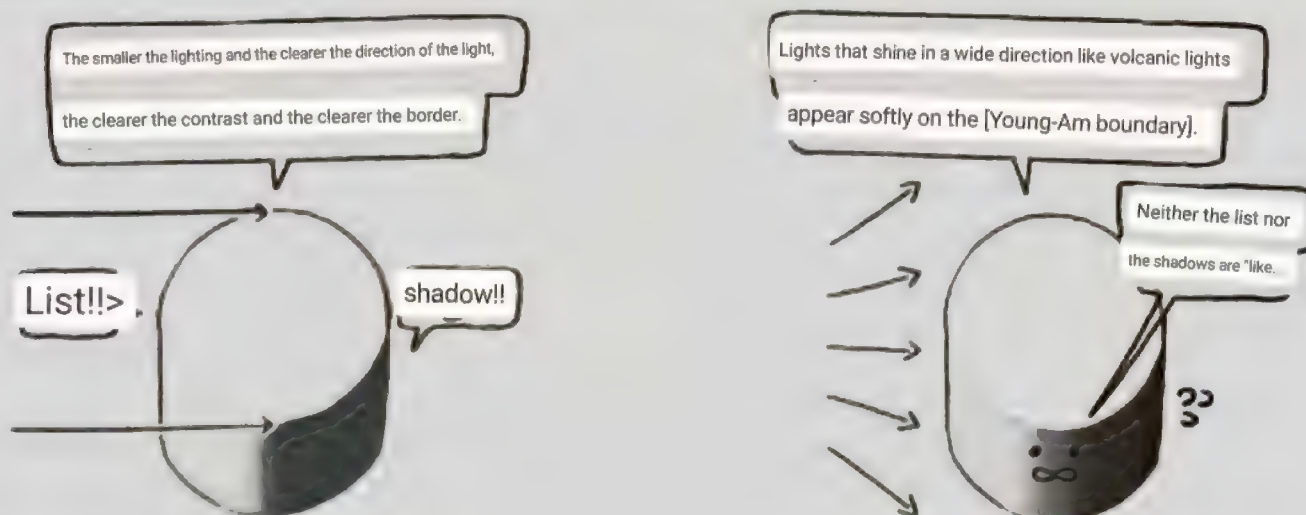
Gadation: The stage in which the brightness changes from the high part to the low part

However, even when the same object is illuminated by the same irradiation method, the shape of the shadow is completely different depending on the direction of the light
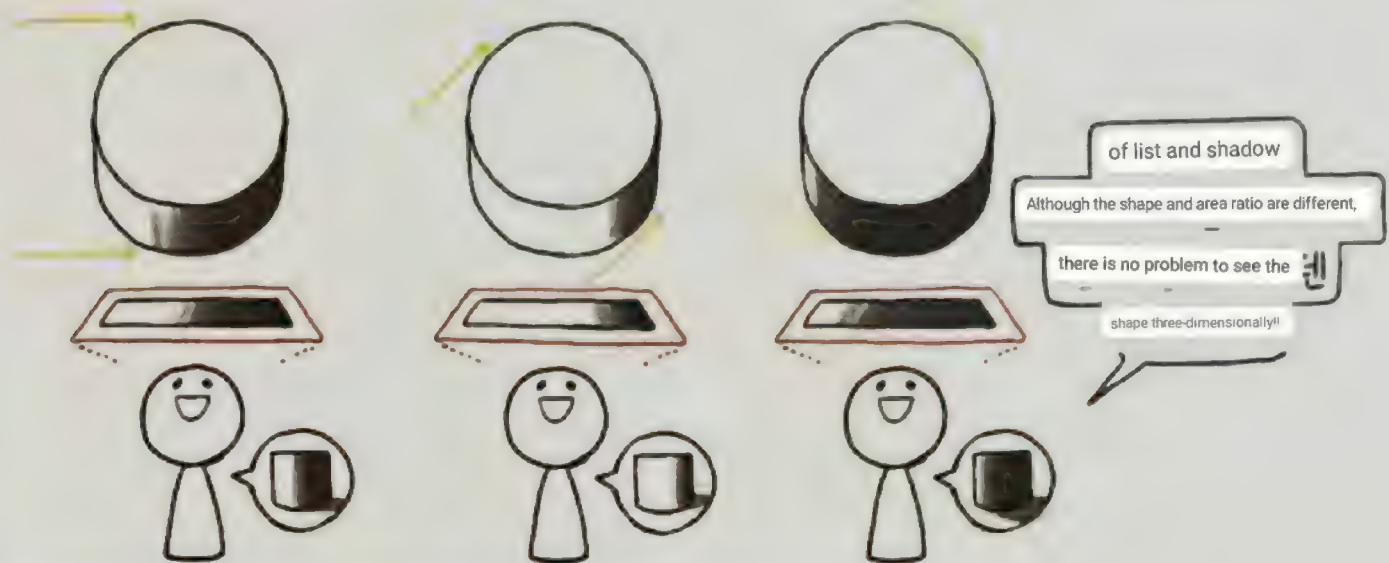
In addition to the difference in the shape of the object, you can create an infinite number of shadow shapes with different types and directions of lighting. Among them,

let's take an example of the direction of lighting that is typically used in photos and drawings to find out the difference between the shape of the shadow and the contrast boundary

The order in which shadows are drawn according to the direction of light

After ignoring the complex structure of the object and replacing it with a simple shape, the shape shadows and shades that occur depending on the light direction are made into a clear shape

The light-dark boundary created by the main name is specified according to the structure of the object

According to the kurtosis of the corner, it is expressed naturally while distinguishing the light and dark boundaries

Adds subtle contrasts in highlights and shadows to create more detailed structure.

2-2 Typical lighting direction

front light

Light that shines from the front of the subject, also called pure light. You can make a delicate depiction, but the shadows are not well exposed, so the three-dimensional effect is not well expressed. It is used more for educational material photos, archival photos, and commemorative photos rather than works.

The part of
the face except the nose

As if there is

closed shadow
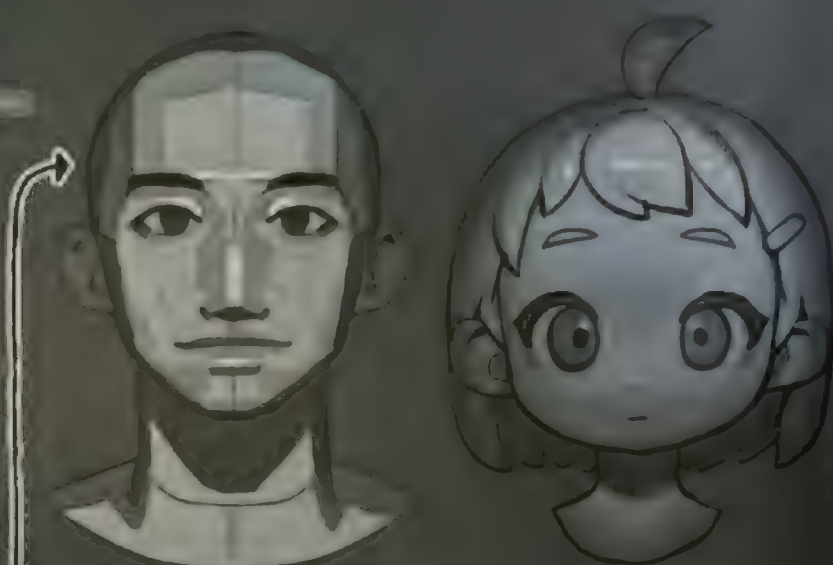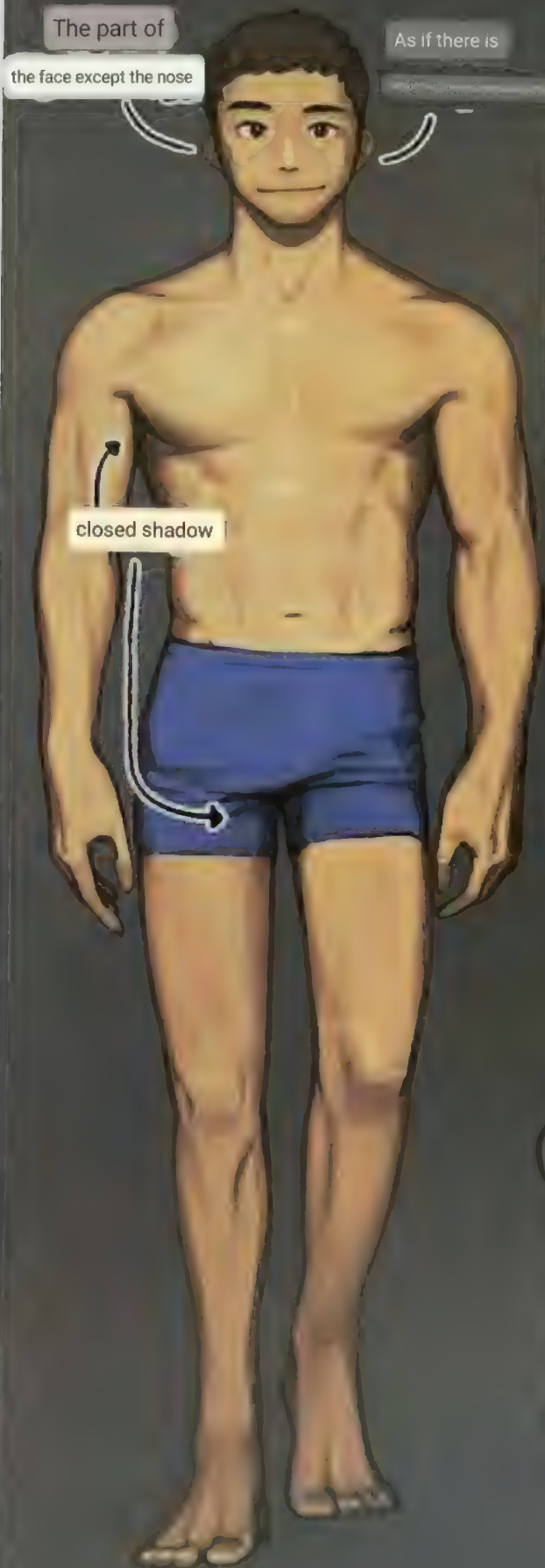
The farther back from the most protruding part, the darker it gets. The shade stands out more than the shape shadow. Areas that are inclined at an angle from the light are dimmed, resulting in relatively sharp shadows. Therefore, the boundaries of the volumetric structure are rather dark.

side light

When the light illuminates the subject from the side, the opposite side of the light creates a sharp shadow, maximizing the object's

three-dimensional effect. Metering can create dramatic depictions, but the shadow area is too wide, so auxiliary lighting is used for a natural depiction.

The area of the

so we need auxiliary lighting

그림자연구

Details
are not displayed.

Highlights and shadows are clearly separated by the center of the object. Relatively

sharp contrasting borders maximize the three-dimensional effect

On the other hand, the details of the structure are not clearly revealed three-dimensionally

because the parts except for the light and dark boundary are cast in

the shadows. The part closest to the direction of the light appears bright

The three-dimensional effect of the

light-dark boundary is very conspicuous

사광(Plane light)

Light that shines obliquely from the front of the subject is called stray light or transfer light. It is similar to the direction of afternoon sunlight. It is the most used lighting direction for depicting people because it can express both delicate and three-dimensional effects.

Shape shadows and their nutritional boundaries are different.

The boundary of the shape shadow is obliquely cast on the object, showing the sense of structure of the object

It is advantageous to express the structure of an object in the form

The rounded corners and shades stand out with different gradation expressions, and

depending on the lighting direction and the structure of the object.

The smoother the surface, the sharper it is.
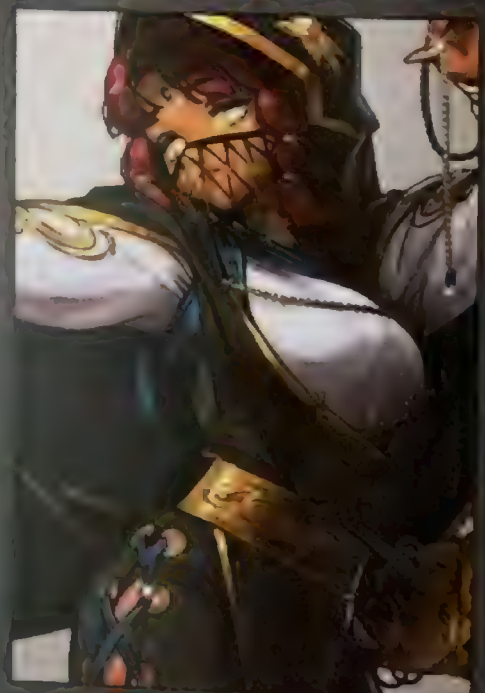
Cross light

It is a light that shines about 45 degrees from the back of the subject. As opposed to streamlight, the object's precision area is obscured by shadows. The area of the highlight is narrow, so it is not used well as the main name, and it is used as an auxiliary light to indicate the hidden area by illuminating the shadow area.
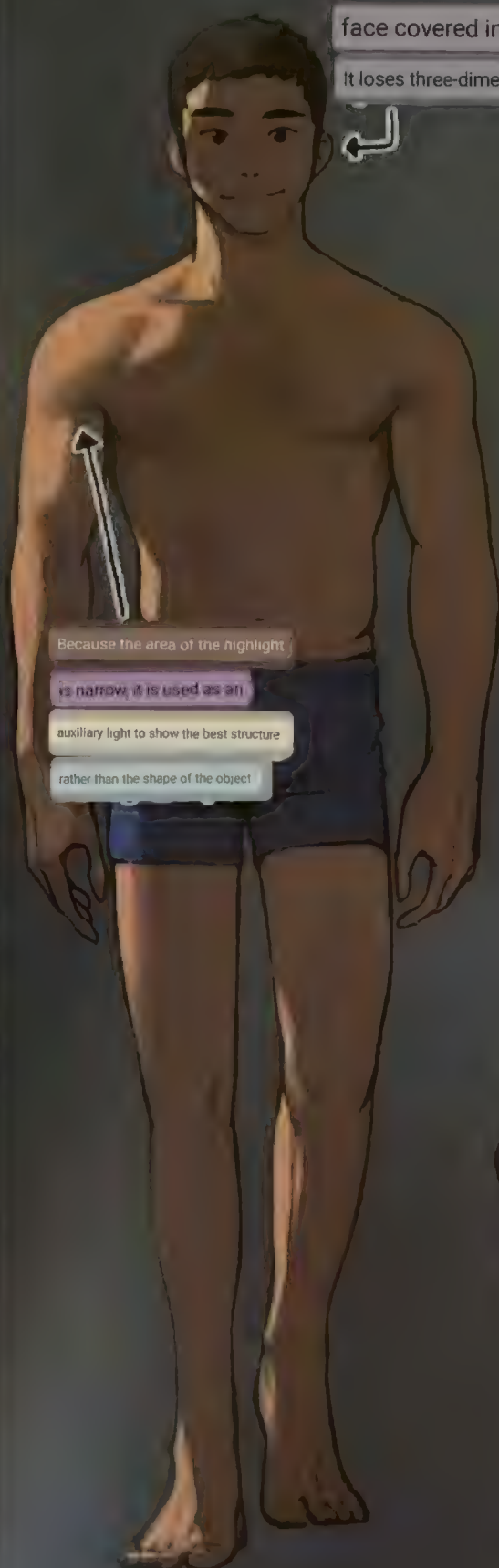
face covered in shadows

It loses three-dimensionality.
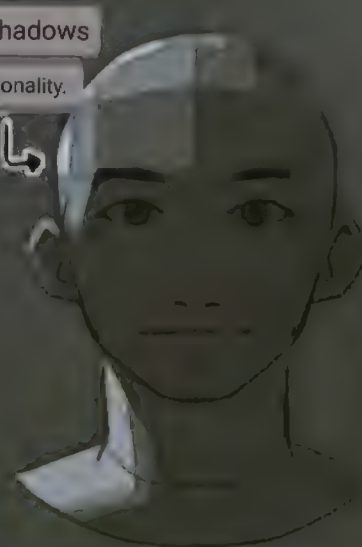
Because the area of the highlight is narrow, it is used as an auxiliary light to show the best structure rather than the shape of the object

The part you want to depict is covered by shadows, which reduces the three-dimensional effect, but the area where the light is shining clearly separates the background from the object. Because the area of the highlight is narrow, it is difficult to express the rounded surface, but it can show even small irregularities on the surface by shining a clear light. It is an auxiliary light, but depending on the role, the illuminance is very strong.

(Historical light can be used as a rim light)

Lighting from the top to the bottom of the subject is called downward, and among them, lighting from the crown of the head in a straight direction is called direct light. Although the area of the shadow is large, only the structure that clearly protrudes from the object is emphasized, so it is a lighting that is used a lot in dramatic productions.

On the face, the **forehead oil** side and the nose are added
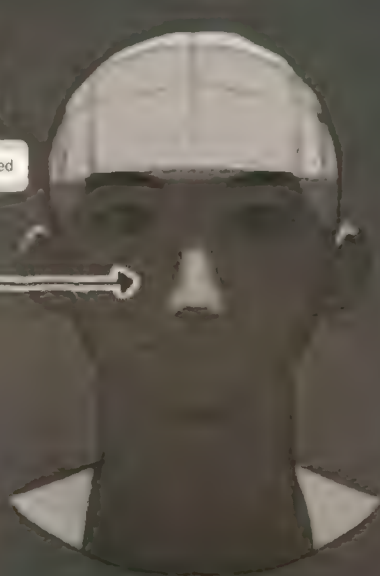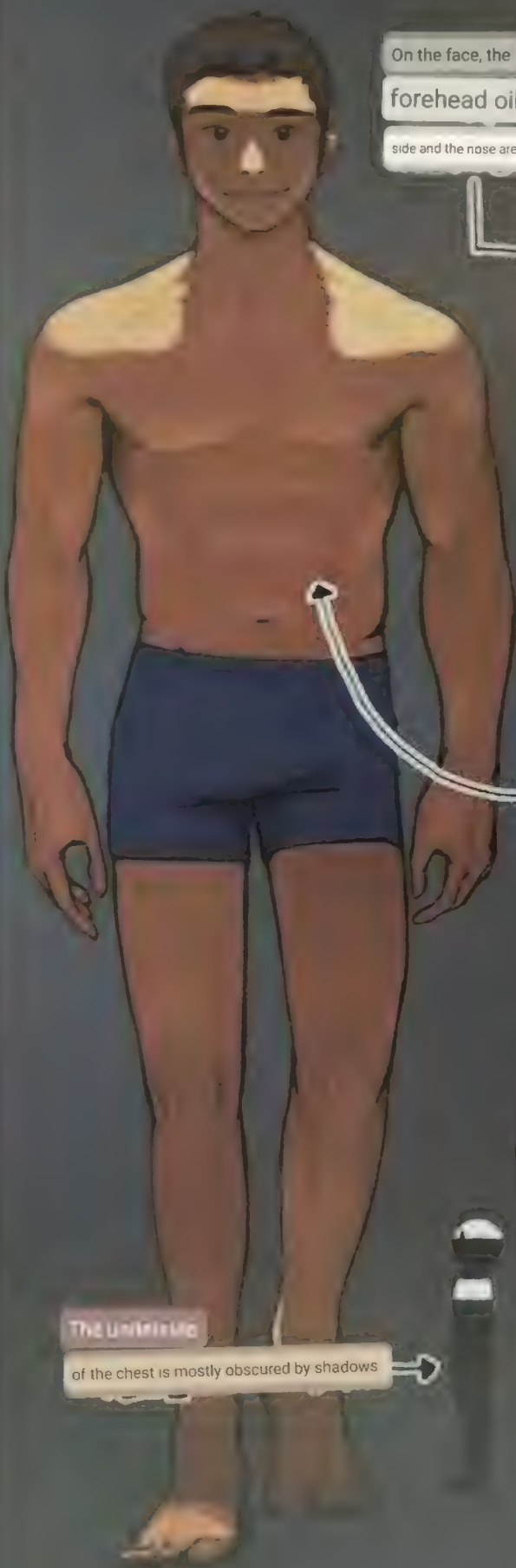
Only parts adjacent to the light and structures protruding from the object are illuminated. Most of the object is covered by the shadow, but the structure can be emphasized enough, and if the shadow is illuminated with auxiliary lighting, dramatic production is possible. As it shines toward the floor, the light reflected from the floor acts as an auxiliary light, and the normal highlights and shadows are reversed.

The underside of the chest is mostly obscured by shadows

Backlight

Lights from behind the subject. The highlight of the object is very narrow and most of it is obscured by shadows except for some object outlines. For this reason, the backlight is not used as a main name, but as a secondary light that serves as a rim light that clearly shows the outline of an object.

Narrow and simple list shape close to a line

the area of the highlight is very narrow. It cannot show a three-dimensional effect with backlight alone

The area of the highlight is extremely narrow, so the gradation of the contrast boundary is very clear, and even the smallest irregularities of the object can be displayed with clear lines. The area of the shadow is too wide to be used as the main name, but it is used as an auxiliary light in various productions because it can separate the object from the background and make the screen richer.

It is better to separate the sense of space between the object and the background rather than the shape of the object

PART 04

texture

HERE ON

1_ Material

▶ What are materials and textures?

One day when I was coloring the world as usual...

(yes?
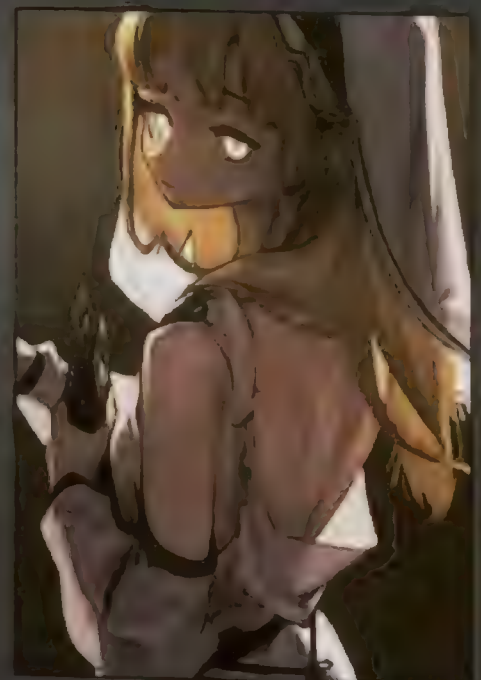
(I changed the same light to an object of the same color

[Why do different colors appear?

oh! When I looked closely, 2

They look different from each other!

The difference between rough and smooth texture...

[Even with the same smooth texture, each material has a different way of reflecting light!

(difference in metal)

(Permeability)

As an object absorbs and reflects a specific wavelength of visible light, the object takes on color, and a shadow appears depending on the illuminance of the light. However, there are cases where objects of the same color have different colors even when the light of the same property is illuminated.

Why? When light hits an object and is reflected, how it is reflected depends on the properties of the object rather than the properties of the light. The properties of different objects are called materials, and the difference between the surfaces that directly reflect light among them is called texture

of an object

If you want to know the exact shape,

you need to know the

difference in materials

besides light and color!

Let's start with the basics...

material

Classification of differences that occur when reflecting/absorbing/refracting light according to the intrinsic properties of an object

- metallic

– 투과성(Penetrability)

texture

Classification of reflectance differences depending on the microscopic curvature of the surface of an object

· Specular reflection: The incident light is reflected in the correct direction and the light arrives as it

is. -Diffuse reflection: The light incident on the bright spot is diffused disorderly and evenly due to the fine curves

It is important to note that the texture of a surface is a subclass of material!

Even objects of the same color reflect and transmit light differently depending on the material of the object.

texture

Depending on the roughness of the surface of the object on which the light shines, light may be reflected as it is or diffused and spread

In other words, the texture of the surface determines how clearly the light source or reflected light appears

It's because of the

7 minute curves on the surface!

It is sometimes

classified as solid/clear

diffuse reflection

metallic)

Conductive metallic objects can interact with wavelengths of light and reflect light at wavelengths that it would normally absorb. An object

with a smooth surface and high metallicity reflects the light source and image as it is, and sharp metal or mirrors are typical examples

⚠ It is not mandatory.

Mmm! Light absorption!

Non-conductive (non metal)

free electrons

Free electrons

reflect all light!!!

Conductor (metal)

Note that the boundary

between insulators and conductors

is quite blurred from a physical point of view.
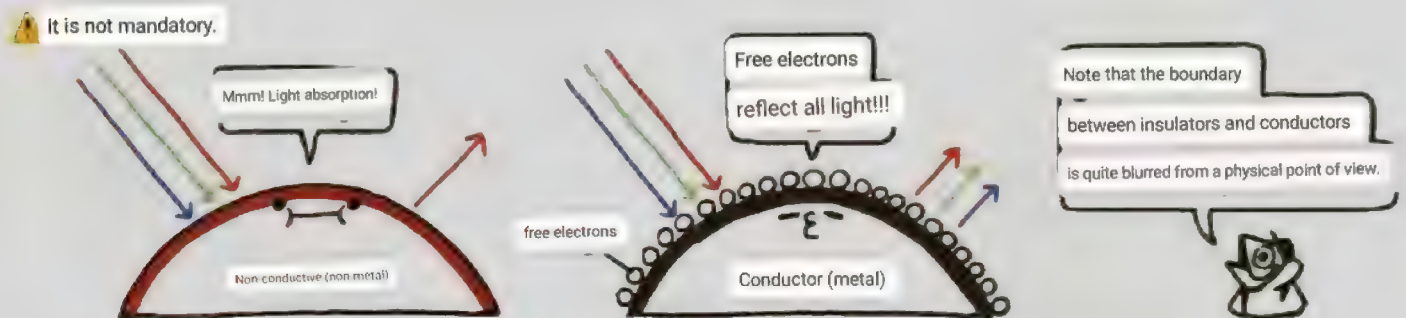
투과성(Penetrability)

Depending on the characteristics of the material or the thickness and hardness of the object, light is transmitted through the object without

being absorbed or reflected. As light passes through an object, refraction, dispersion, and scattering may occur, and the properties of light may change at this time

reflect

a common object

It absorbs/reflects light

and takes on color...

depending on the material

Light can even penetrate objects!

uh.?

Also

called

layered material.

1. Texture

Panel 1: First, let's shine 2 - the same light on two objects with different surfaces!

Panel 2: Even if light shines on an object with a rough surface in the same direction — 100 Lx

Panel 3: As the light diffuses from the surface, it spreads out widely and evenly!!

Panel 4: (Then what if the same light shines on a smooth object?) 100 Lx

Panel 5: It's reflected straight in the right direction!" 100 Lx

Panel 6: It's just a difference in the diffusion and concentration of light reflection (The amount of light is the same~ Both are equally bright!

If there is a fine curve on the surface where the light shines, the light reflecting the light on the surface of the object is different for each minute curve, so the light shining on the highlight spreads widely as much as the curve is rough called diffuse). In the part where the diffuse reflection occurred, the light spreads evenly throughout the highlight and becomes brighter, so the color of the object appears intact. Conversely, an object with a smooth surface reflects light in a specific direction, which is called specular reflection. Because the illuminance and color of the light source appear exactly where the light is reflected, the rest of the area reflects the light in different directions. The object color appears dark. In other words, the amount of light reaching our eyes (luminance) is the same, only the degree of diffusion of the reflected light is different

Glossary

① Specular light

② object color (basecolor)

③ 상 (相, specular reflection)
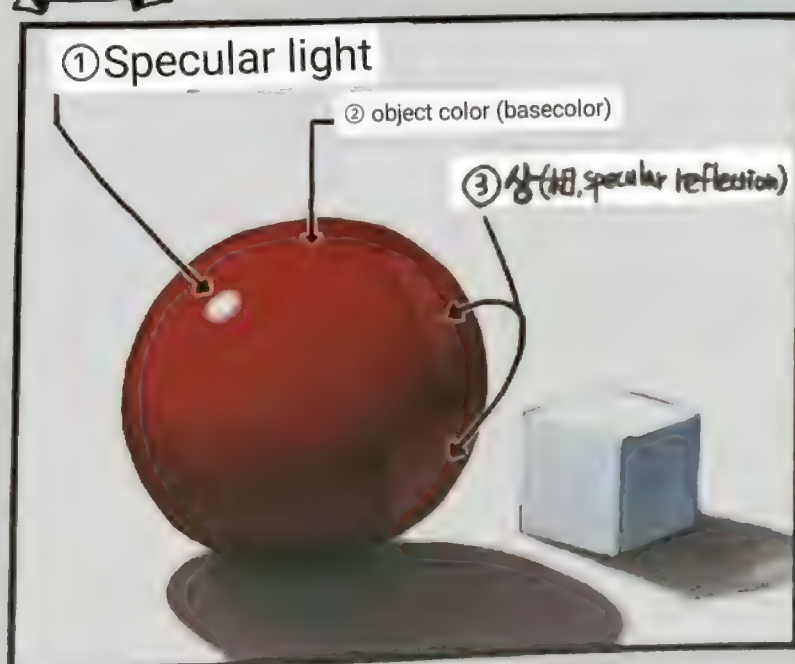
① Specular light.
The light reflected from the light source.

② Base color
It is the intrinsic color of an object that appears when the light of the appropriate degree is evenly illuminated on the object

Phase (Specular reflection) Refers to a person who is clearly reflected by the shape of the light source, the surrounding environment, and the shape of the object.
(Originally, it is the same term as ①)

Rough texture - diffuse reflection

A simple distinction between the roster and the

shadow appears as the words spread evenly throughout the

roster. The light source can be inferred through

the book of the list and the shape of

the shadow. Because changes in object color appear

intuitively, practice based on diffusely reflecting

objects when understanding basic light and color

Smooth texture - specular reflection

It is difficult to observe the color of an object

intuitively because only the part where the light

is accurately reflected becomes bright and the other parts

appear somewhat dark. Instead, you can

observe the sharp reflections of the specular and phase in

the highlights, making it relatively easy and

accurate to know which light is shining on the object.

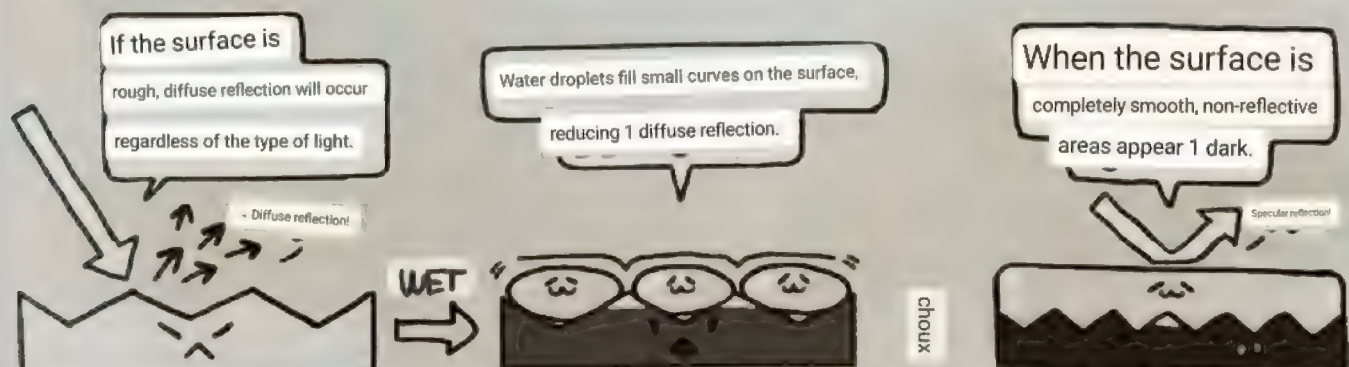**TMI** ♥ Why stones darken when wet

Since ordinary stone has a rough surface, it is one of the most representative materials where diffuse reflection occurs without specularity

However, if you pick up a pebble in the river and look at it, you will see a dark object color with a clear specular. Why? When a stone

comes into contact with water, water droplets fill between the small curves of the stone's surface, preventing the light from spreading evenly, and the

surface is covered with a smooth surface and specular reflection occurs. An object in which the object is covered with a transparent material is said to be layered. Even

if an object has an inherently rough surface, the object color and speckler may appear at the same time if it undergoes polishing such as coating

If the surface is rough, diffuse reflection will occur regardless of the type of light.

- Diffuse reflection!

Water droplets fill small curves on the surface, reducing 1 diffuse reflection.

WET

When the surface is completely smooth, non-reflective areas appear 1 dark.

Specular reflection!

choux
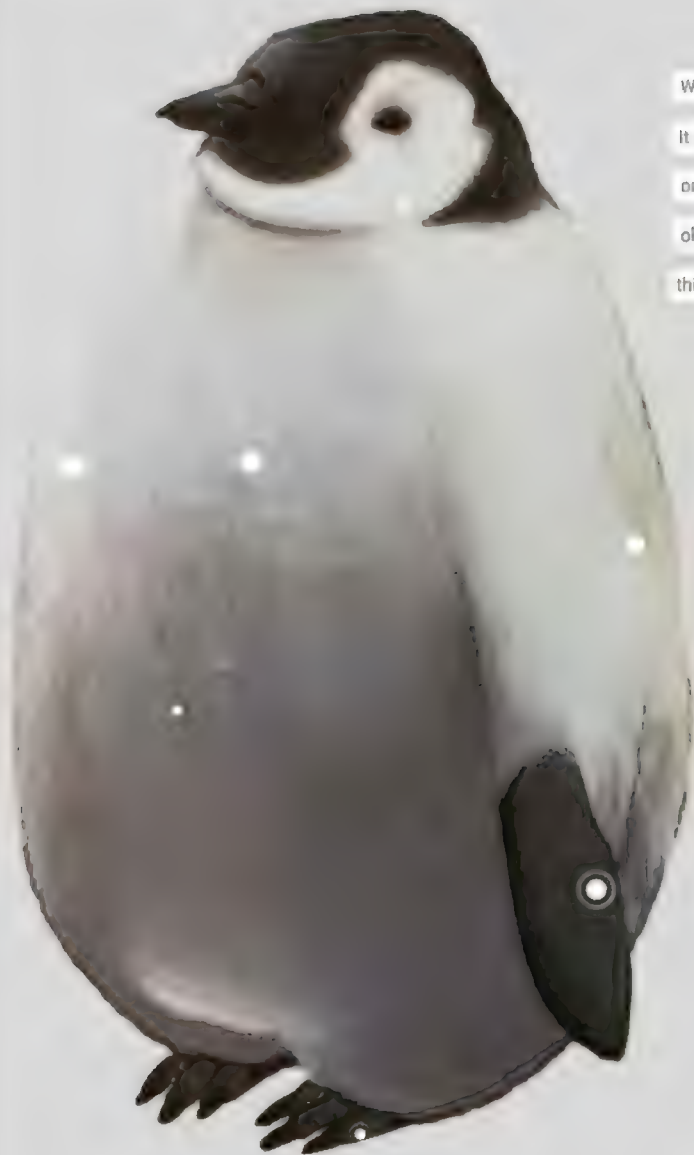
When the surface is rough, the specular is spread evenly throughout the highlight

It shows the color of the molded object that is spread rather than concentrated

on the hand. Since the properties and shape of the light source do not appear on the

object intuitively, when draw .g such a texture, it is recommended to color the object after

thinking about how the object color will look by the light.

Diffuse reflection occurs in the human skin as well due

to minute curves, but it also has a different texture due to the fine

hairs of the epidermis, oil, and moisture. The smoother the texture, the

clearer the contrast between the highlights (specular) and the shadows, and in general,

this appearance is more common on hard objects than on soft textures.

However, the three-dimensional effect of the form is relatively unclear.
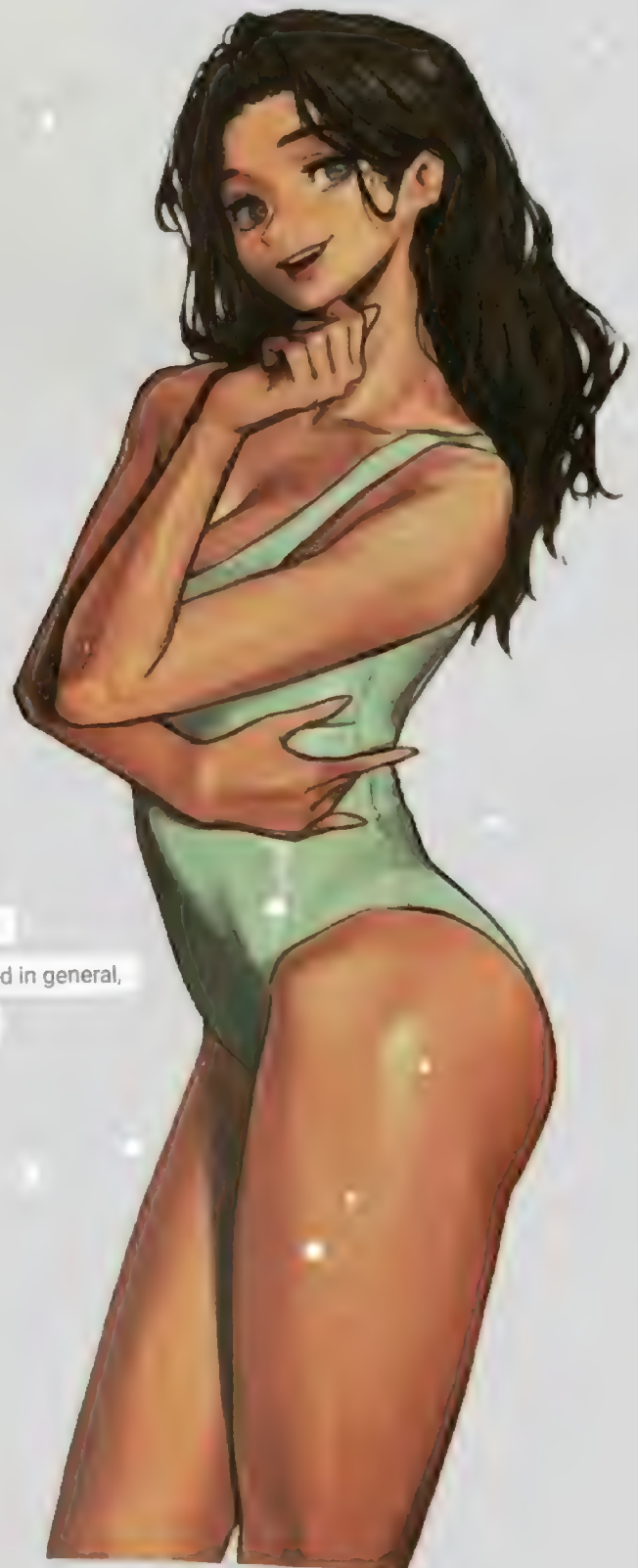
The criteria for distinguishing specular and

diffuse reflections are very blurry.

The sharper the specular object, the

less feeling of use and better for artificial texture

expression. By adjusting the degree of smooth

surface, you can express rich texture

even when drawing objects of the same color

[Blur the specular as it diffuses and lower

the brightness slightly (by lowering the layer opacity)

) to show the light diffusion

Specul

blurred

M

Color the base color of the diffusely

reflective object brightly, and for the

texture with specular reflection such

as leather, color the base color a little darker.

The more vivid the

specular the material

is, the more it is affected

by the light source in coloring.

Objects that are touched with small curvatures on the surface can observe specular dispersion according to the curvature of the surface. When coloring these textures, it is effective to describe them so that the textures appear well in the regular. Let's see how to create a textured brush by applying a texture in the brush tool.

① Prepare an achromatic texture image.
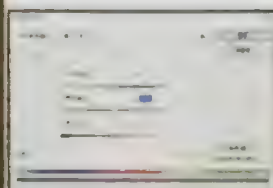
Desaturate
with GH+U.

2 Save the image as a pattern using the edit pattern definition.
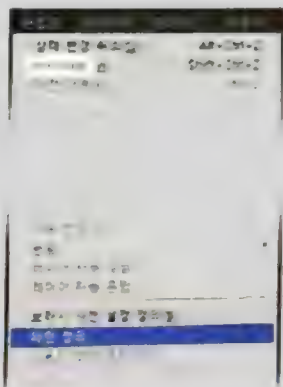
Alt+E

Save the current
image in pattern format.
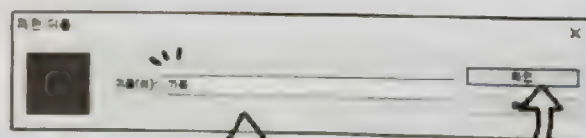
Name the pattern and save it!

③ In the brush settings, go to the texture item.

Shortcut for brush settings is FS

여기⇨

Other items of brush theory
will be explored in 147 P.
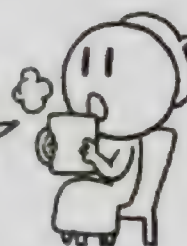
④ Load the saved texture pattern, adjust the value, and save it.

↑

Import the required pattern

and apply it to the brush.

uncheck
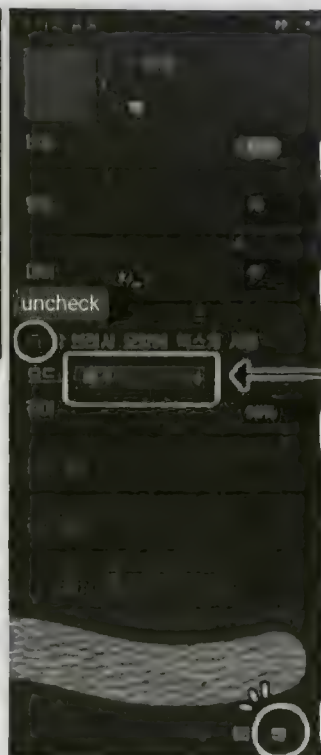
◆Adjust the size ratio of the pattern.

◆Adjust the brightness of the pattern.

◆Adjust the contrast of brightness.

-Select multiplication/subtraction.

◆Adjust the sharpness of the texture.

Try other items
↓

check the preview

← Save.

⑤ Use it as a brush to color the specular of the corresponding texture

What if the specularly

reflective color is appropriate,

but the texture is unsatisfactory?

Specular dispersed

according to the surface texture!

2. Material

① metallic

> Diffuse reflection, in which light is evenly spread

> Even with the same specular texture [Isn't there a case where the color of the specular is different?]
>
> It's definitely red, but...
>
> Can you call this red?

> For what the hell is this difference?
>
> I don't know the color of this object!!
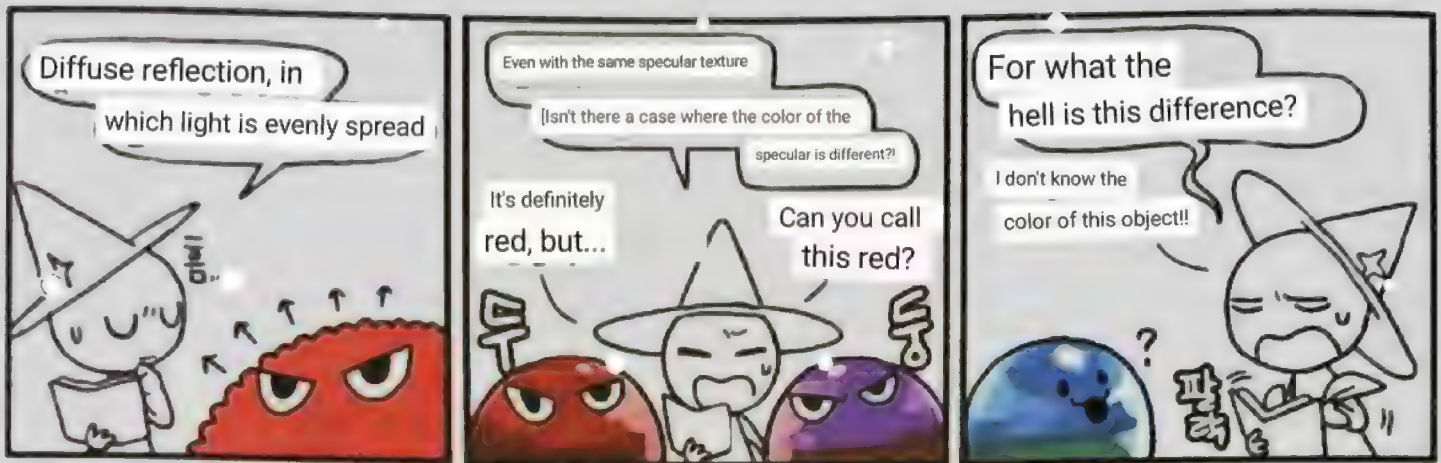
Even for specularly reflective objects that accurately reflect light, the color of the reflected light varies depending on how much metal the material has. Metals can reflect light of all wavelengths due to the movement of free electrons, and this property is called metallic.

> If you illuminate the drop-point illuminance, only the red wavelength will be reflected

No metallicity (non-conductive)

> If it is metallic, it can reflect other wavelengths too!
>
> free electrons
>
> rather than a reflection

> The all-metal material reflects light of any color regardless of the object color!

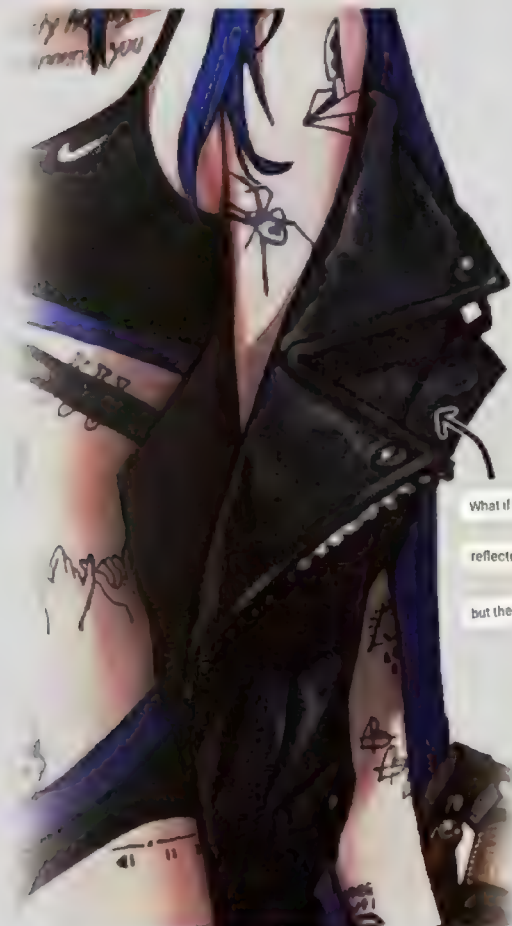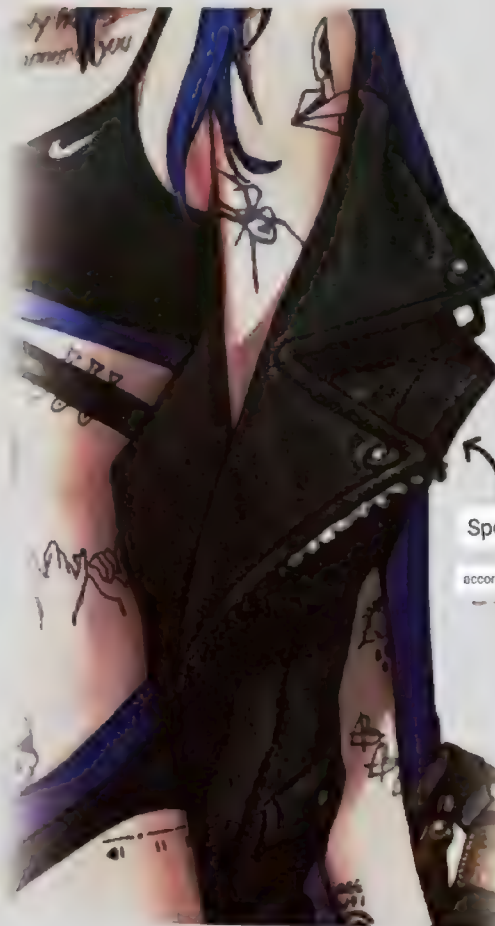High metallicity (conductor)
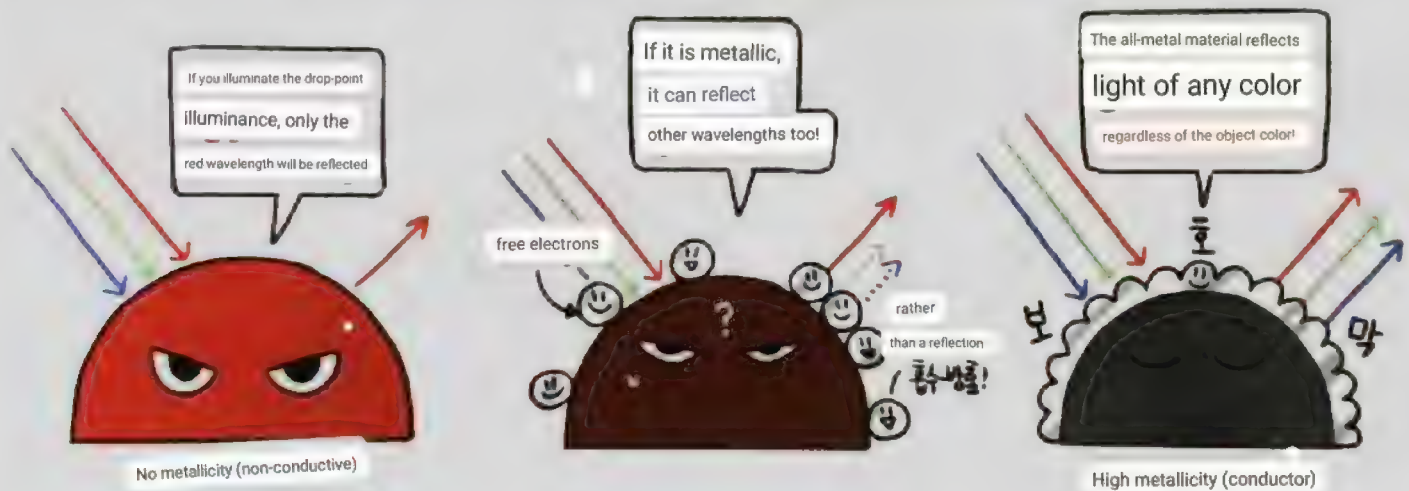
Objects that do not conduct electricity, such as wood and plastic, only have a difference in the brightness of the existing object's color in the speculum. Such objects are called insulators. However, highly metallic objects clearly reflect light of all colors due to the movement of free electrons. These objects are called conductors. In other words, the higher the metallicity, the less the color of the object appears and the color of the light source appears more clearly on the surface

> The object color and the specular color (hue) are similar! The brightness/saturation of the specular becomes important...
>
> (Insulator

> [The color of the object is not visible, and the color of the light source is clearly specular!
>
> conductor

<Same texture. other material
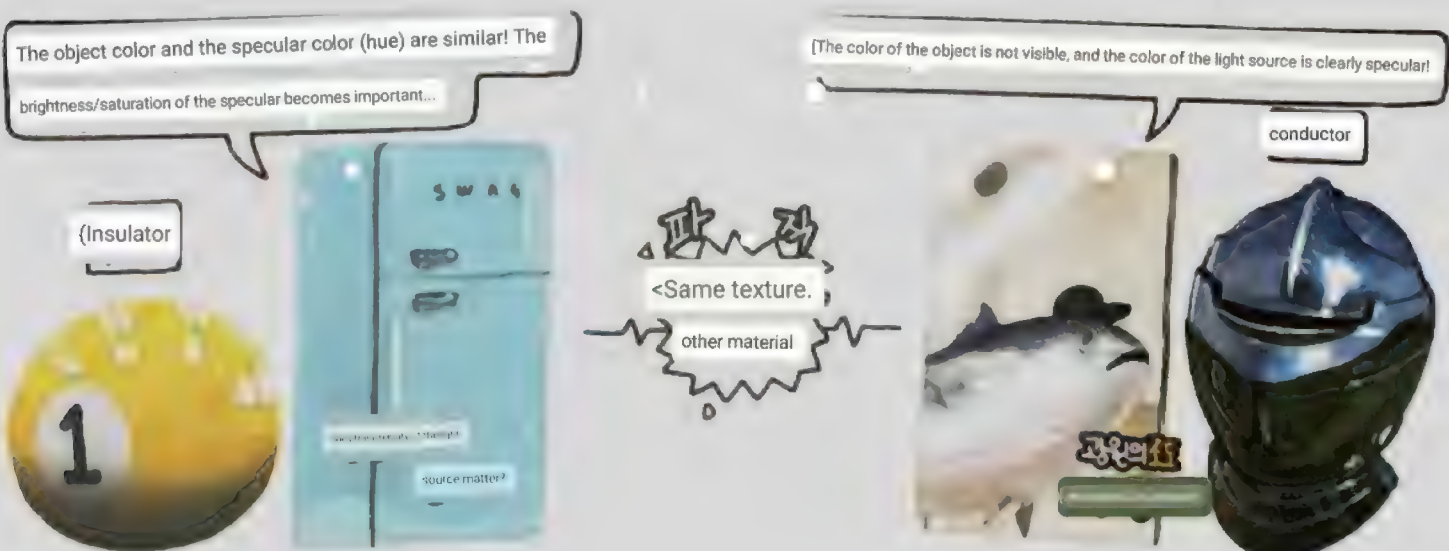
Certain colors are also reflected in the clear specular due to the influence of the metallicity of the object and the inherent color of the metal

High metallic feel and artificial feel

non-conductive material

Add yellow!)

corroded metal

The surface becomes rough

and the object color

changes due to diffuse reflection

(Each metal

has its

own color

high metallic

(Metal luster (coating) feeling)

Medium metallicity is rare!
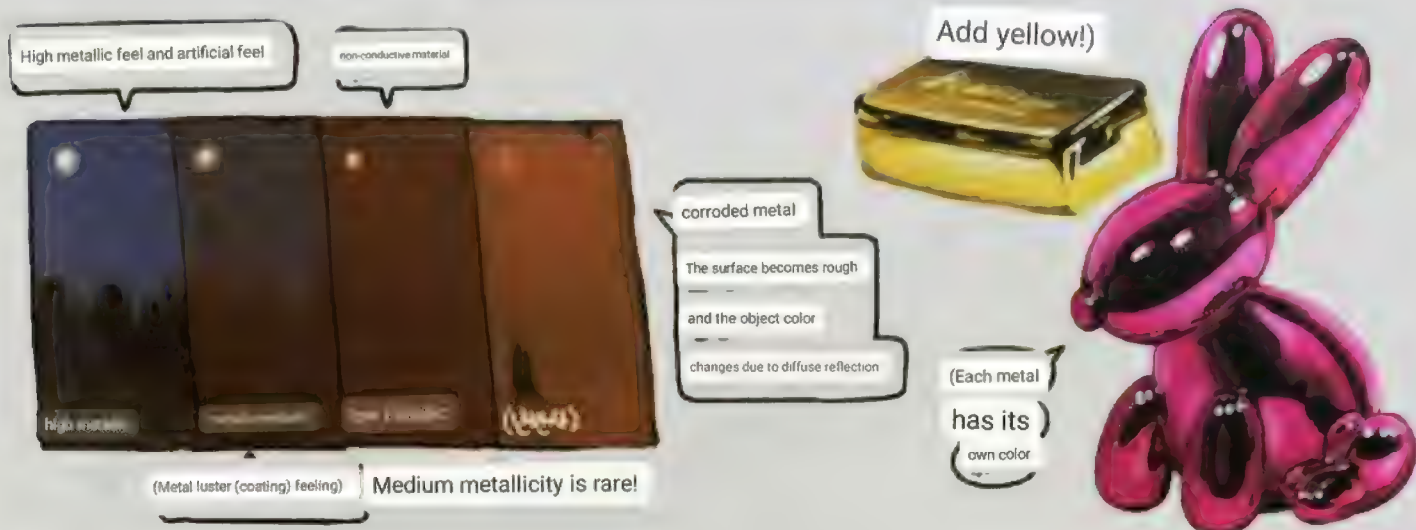
The less saturated and darker the color of the object, the more vivid the color of the specular.

Let the yellow light shine!

Yellow is added

to the red object color!

no object color

You can see the

color of the light source more clearly!

therefore

A black car has a better face than a red car.
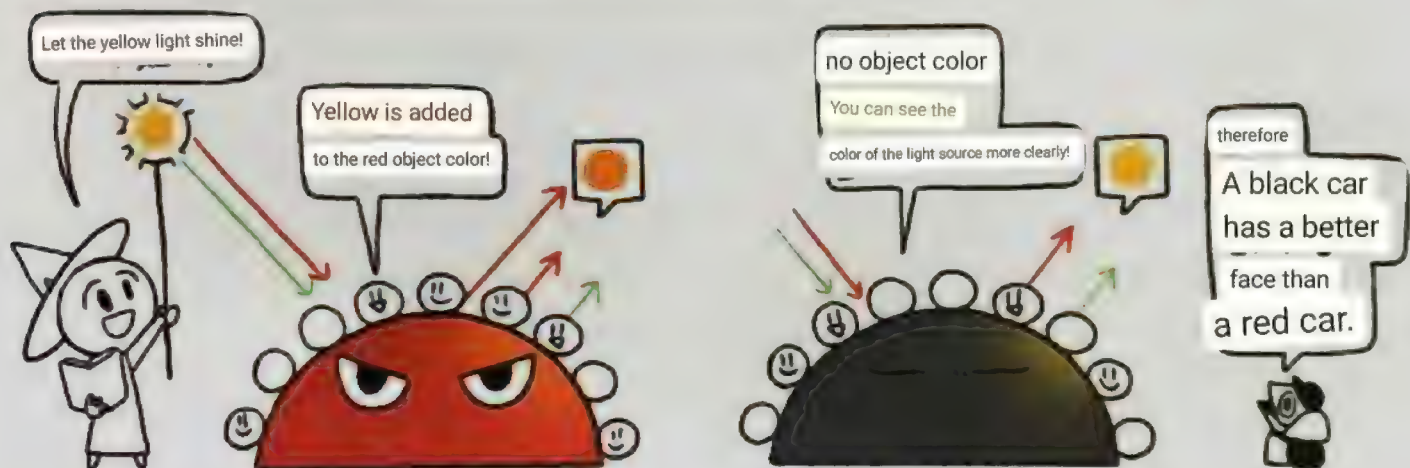
TMI ↻ Let's paint the specular of the insulator with a complementary color

When expressing light shining on an object, linear dodge synthesis can be used to represent additive mixing. A metallic object that reflects

all colors can be synthesized using the color of the light source as it is, but in the case of an insulator, it must be synthesized by

adjusting the color.

To depict a specular of the same color as the object color, the object color is subtracted from white light and the complementary color of the object color is synthesized with a linear dodge

linear dodge

Only the color of the light source is added

low light

common metal specular

Insulators (plastics, etc.)
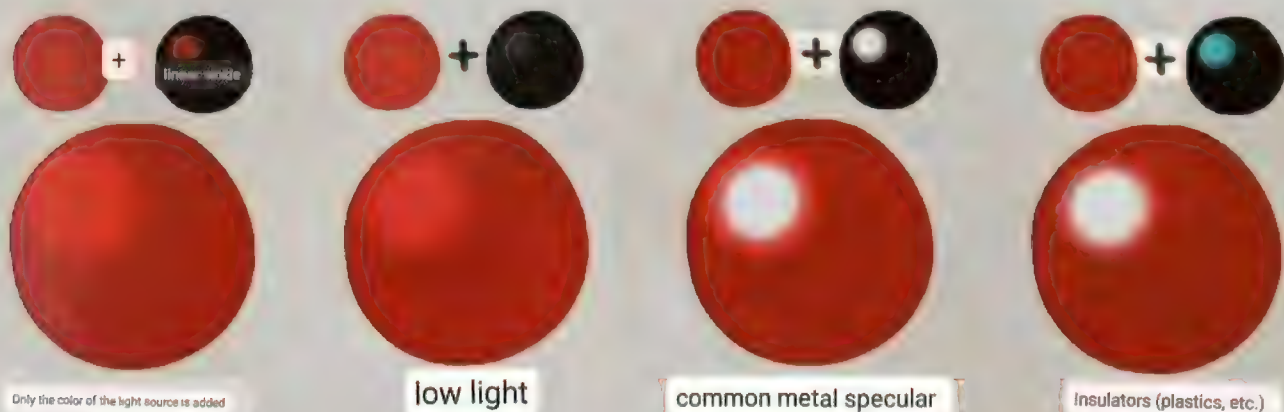
2 투과성(penetrability)
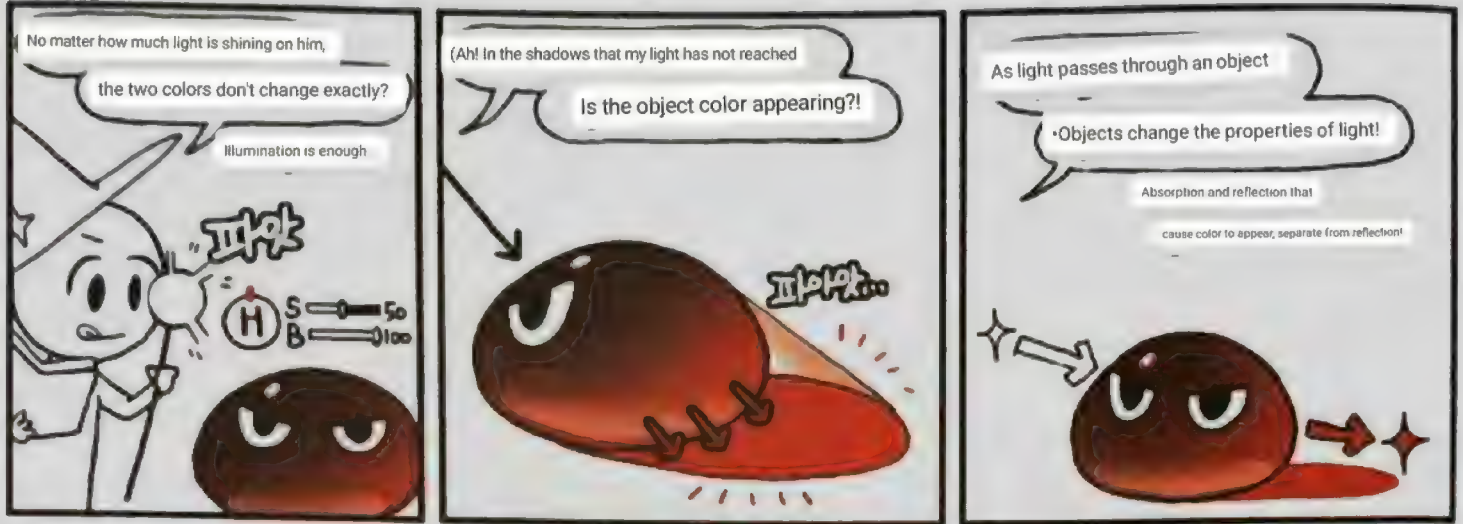
When an object absorbs and reflects certain wavelengths of light, it soon appears as

a color. Depending on the material or thickness of the object, the light incident on the object may pass through the object completely without

being absorbed or reflected. The property of an object with this property is called penetrability, and the permeability differs depending on the material.

▶ Principle of Transparency

If the distance between molecules forming a substance is tight, light

absorption or reflection occurs and a specific color appears on the object. looks good

Some substances do not react with the wavelength of visible light, in which case light (visible light) passes through the object and appears transparent
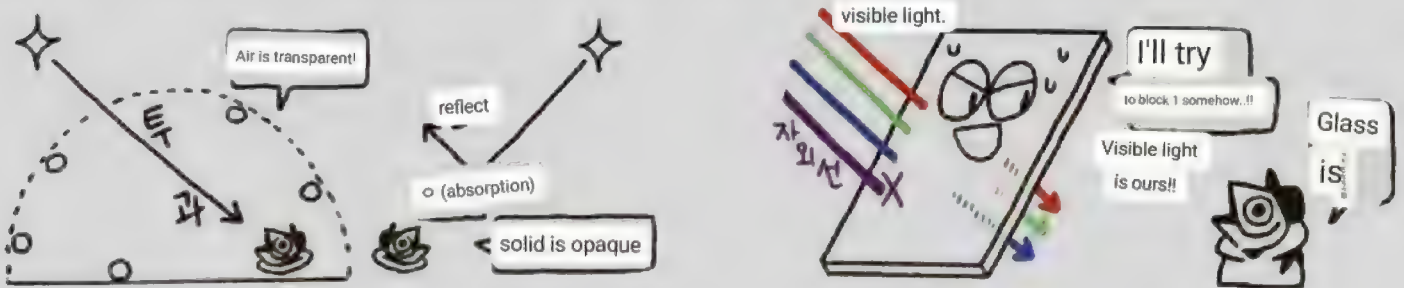
▶ Transparent color

When an object transmits all wavelengths of light, it becomes transparent, but when only a specific wavelength is transmitted, the color of the light changes, which is called transmitted color
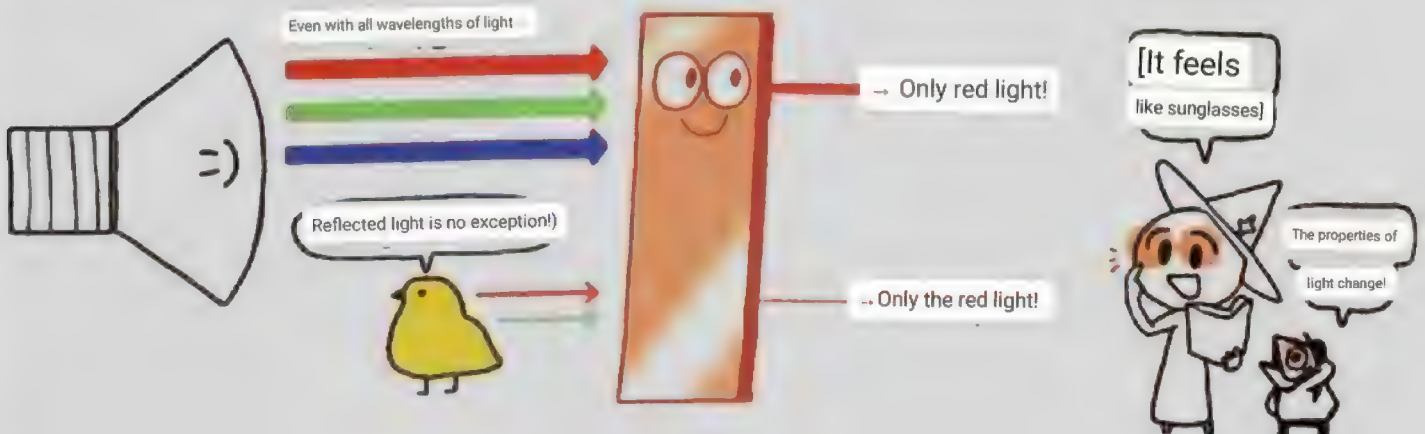
▶ Scattering

When light exits through a transmissive object, it refracts at irregular angles and scatters widely. If the thickness

of the object is thick or the transmittance is low, it is scattered more strongly, and the transmitted light is spread widely.

The direction of transmitted light is refracted and scattered!

The direction of the light is scattered and the image of the light source is blurred.

The light may be weak depending on the transmitted color.

3. Layered material

Since the permeability of a material is not a property that appears on the surface of an object, the specularity of the

surface of an object appears according to the texture and metallicity of the surface

Objects that display more than one material like this are called layered materials.

Many objects in the world have these materials. Typically, human skin is also a complex layered material.

(What material
(made of?)

Because it is a diffusely reflective

texture, the color of the

object is simply [appears!]

It is transmissive, so its

transparent but smooth

surface reflects the surrounding light.

Human skin is typical.

The thinner and brighter the epidermis, the

more transparent the color of the blood

There is a difference in texture depending on the surface,

The permeability depends on the thickness, and the permeation color

appears differently depending on the pigment!

or   or

PART 05

phenomenon

HERE ON

1_Effects&Phenomena

Various optical phenomena appear due to the interaction of light and materials as we saw earlier. From the rainbow created by the

sun and water droplets to the brilliant colors of jewels, you can observe this phenomenon in a variety of places.

When you color the world, you can make a more realistic expression by using various phenomena. Also,

some phenomena can be observed under very rare circumstances, which can be used to create fantastical appearances

It's something I've seen

once, but it's all made of light and materials!!

rainbow!

sleep reflex!)

Aurora!

(jewel!)

Pretty!>

red border!

Pigeon shine.

It's like *magic*

that light creates.

It is good to express wonderful phenomena in appropriate situations, but it is also used exceptionally for effective production of creations.

+brilliance

+subsurface scattering

If you color too faithfully to the principle,

you cannot express the originality of the painting,

so it can be used as a seasoning!

Hmm.. Commercial Army...

a little bit not

too much
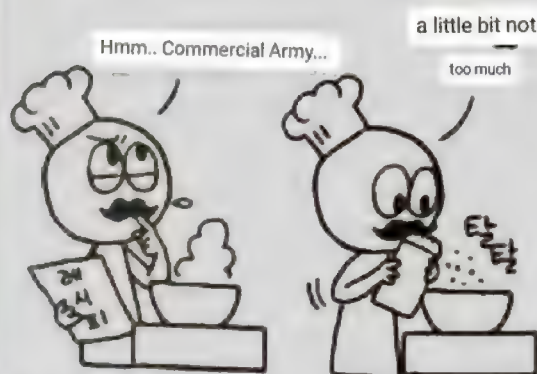
1. Radiance

When an object exposed to strong light appears to emit light by itself while reflecting the light clearly, it is called radiance. All colored objects reflect light at least weakly, but it is rare for a reflected light to have a strong impact on the environment. If the light and color that an object reflects becomes clearer than necessary, the object color or light appears in the surrounding environment as well. When the illuminance of the main light source is very high, the brilliance can be easily observed when all indirect light, including reflected light, becomes clear
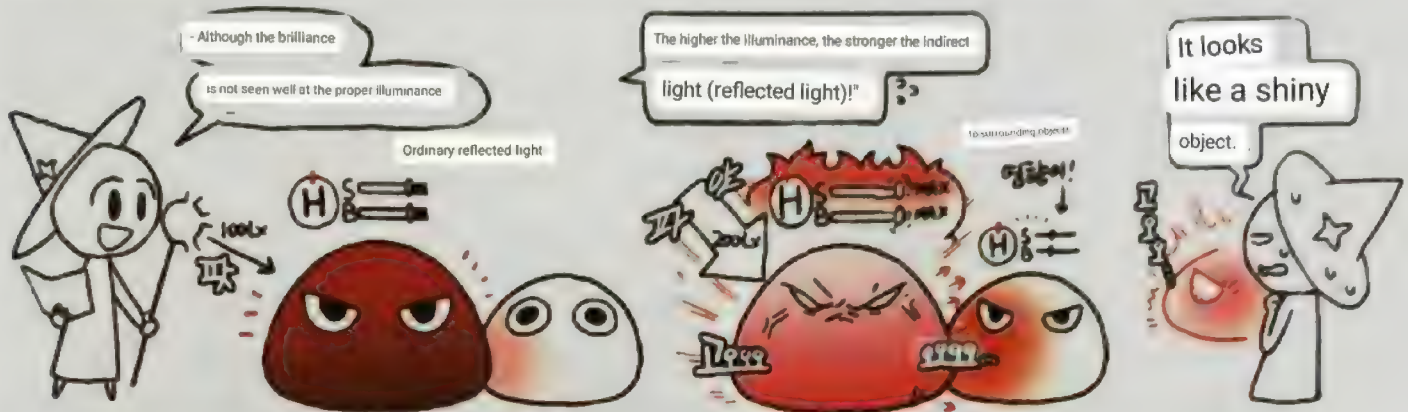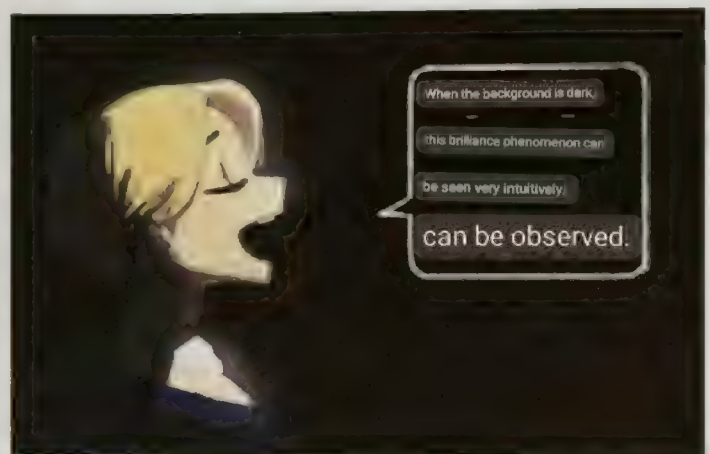
- Although the brilliance

is not seen well at the proper illuminance

Ordinary reflected light

The higher the illuminance, the stronger the indirect

light (reflected light)!"

to surrounding object

It looks like a shiny object.

When objects of the same color are close to each other, the colors become more vivid and the characters appear shining on stage

Gold is sharper when adjacent to each other. take color.

When the background is dark, this brilliance phenomenon can be seen very intuitively.

can be observed.

Luminescence is often used to maximize the appearance of light in strong illuminance or highlights of brightly colored objects
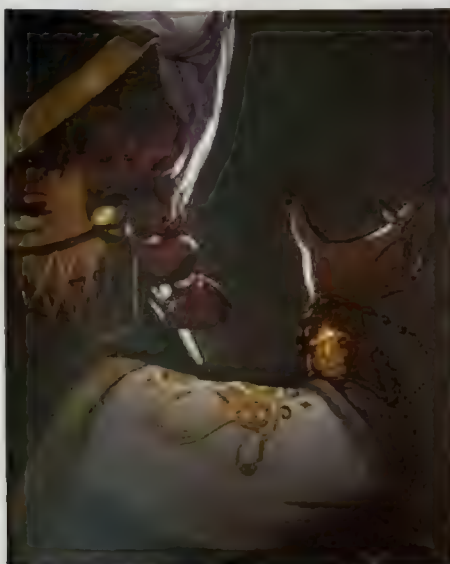
To emphasize the role of rimlights

or make white objects brighter...

The color of the object around the object

Composite with screen or

soft light!!

Airbrush recommended!!

2. Rainbow and rainbow colors

2-1. rainbow

You may have seen rainbows arcing in the sky after rain. The rainbow is one of the representative natural optical phenomena. A rainbow appears as an arc with a continuous red-violet color spectrum. As white sunlight is refracted in water droplets in the air, it is dispersed into various colors of light, and when conditions are met, it can be created in artificial environments such as sprinklers.

Unless the light is transmitted.

The light transmitted through the water drop appears as it is.

The light refracted from the water drop is dispersed into multiple colors!

white light /refraction:

refraction:

It appears as an arc in the form of a cross section of a cone.

[I can't get close!

As a rainbow is a phenomenon that is not a material, it is often used in fantasy productions because of the fact that it is permanently physically inaccessible beyond a certain distance from the observer and that it can only be observed with the back of the light source under certain circumstances.

-John Constable, Landscape with a Double Rainbow, oil painting, 1812

2-2 iridescence

Light usually has one color, but soap bubbles and abalone shells have indescribably colorful colors. When light is diffracted from

a very thin film, etc., it takes on different colors depending on the viewing angle, which is called iridescence. Complete iridescent colors are rare

in nature, but due to this phenomenon, animals with two or three colors are more common than you might think. Structural

factors with pigments and colors caused by light diffraction are called structural colors, and they can be easily found in natural objects.

When light is reflected from a normal surface,

the color is determined by the color of the object, but due to diffraction of light, different wavelengths are reflected.

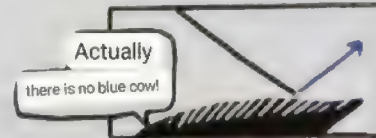The top and bottom of a very thin film
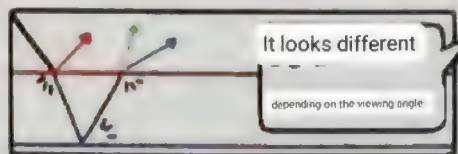
It looks different

depending on the viewing angle

The structural color of the blue

feather is tinted by light diffraction!

Actually

there is no blue cow!

You don't

need to know when to color

Reflects
blue light √

Reflects with rainbow
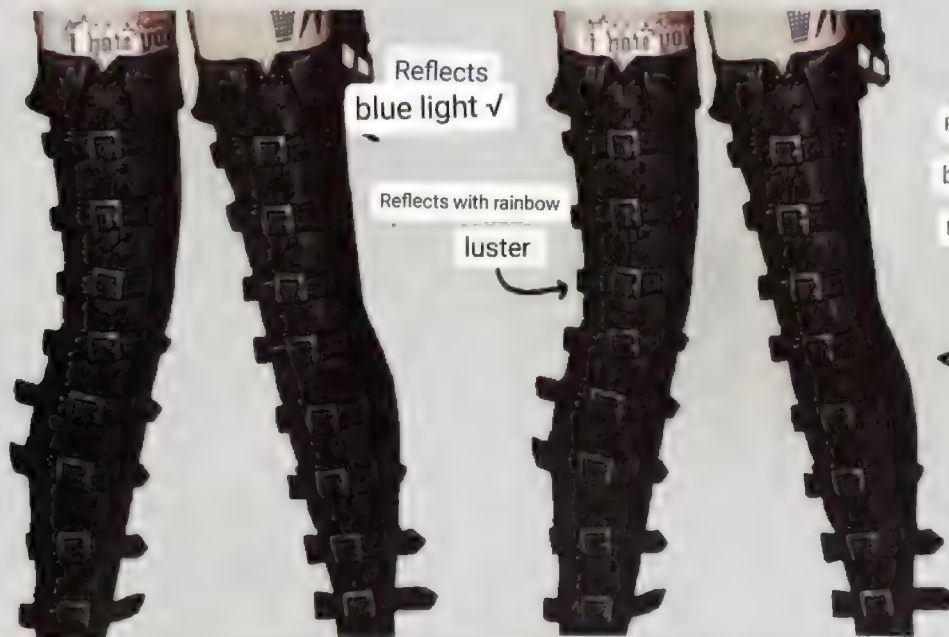
luster

Rainbow colors can only be seen in certain materials,

but by reflecting them on ordinary

luster, you can create a mysterious and rare feeling

Works great on achromatic objects!

TMI Are blue animals rare in nature?

Most blue animals have blue as their structural color, even if they are not brightly colored, such as silkworms and hummingbirds. Animal

pigments are usually concentrated on the skin, so the blue color that appears on fur or feathers other than the skin is often a structural color.

butterfly

bird

iris

Ring octopus....

The only vertebrates with blue cows?
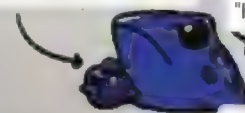
"Hmm... fake girls.

blue poison arrow frog

3. Fresnel Effect

If you look down from above on a clear water surface, your feet can see clearly below the water surface, but the farther away you are from the view, the more the reflection of the water becomes more pronounced. When light reaches a transmissive object, the reflectance and transmittance of the same light are different depending on the angle at which the light shines and the angle at which it is reflected. As the light enters vertically, the transmittance increases so that the bottom of the water can be seen. This formula is called the fresnel effect, after the person who discovered it.
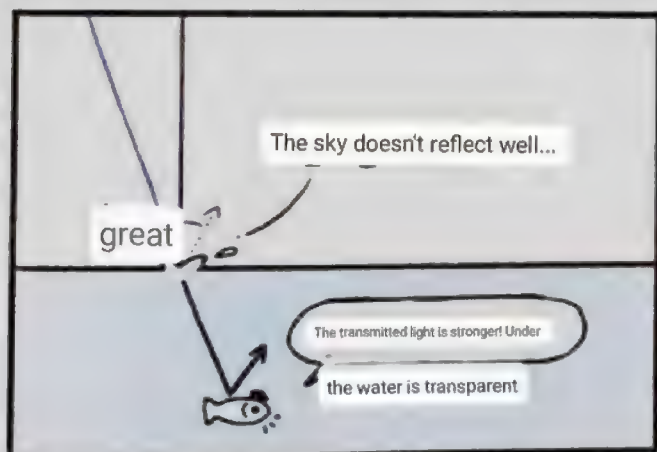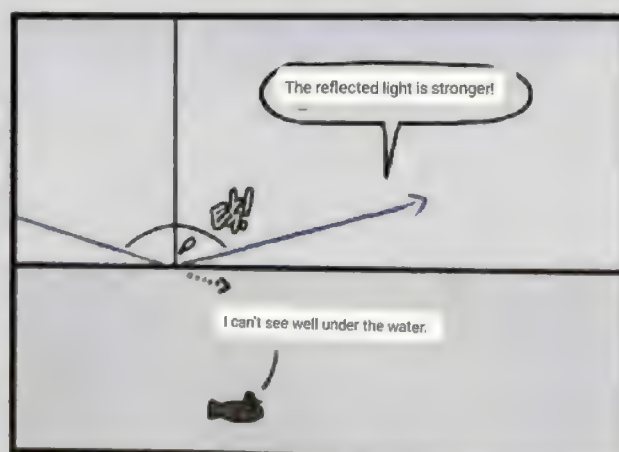
As the distance between the observer and the surface of the water increases, you will see the surface of the water at an angle, so you can observe the reflection of the sky or environment on the far surface of the water. Shadows or reflections of black objects appear below the surface of the water.
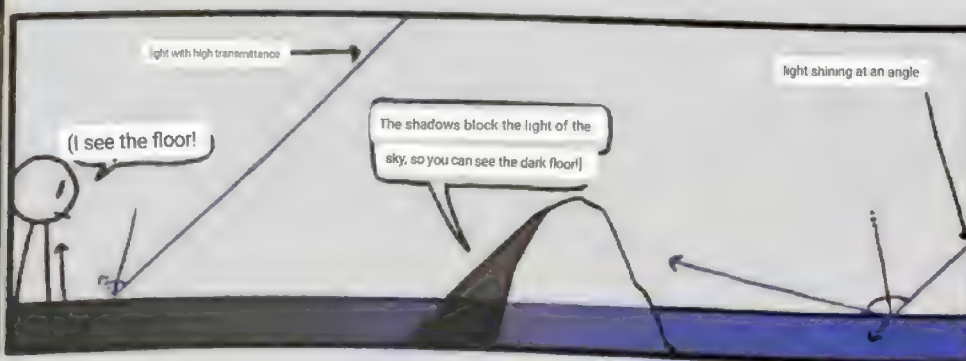
3-1. Applying the Fresnel effect to an object

(Diffuse reflection doesn't show the Fresnel effect well...

diffuse reflection

Specular reflection (Fresnel X)

Specular Reflection (Fresnel)

In addition to the perspective effect in space, the Fresnel effect can also be found when observing the exterior of a three-dimensional object. Light shining on the front of a spherical object is reflected vertically to the eye, and the same light is reflected at a more oblique angle from the side. You can.

I bumped into it at an angle on the outskirts!

reflected light

(mainly..)

Objects and walls feel like light is sliding...

At least

it reflected well!

[The reflection is just right!

The front of the object does not slide well!
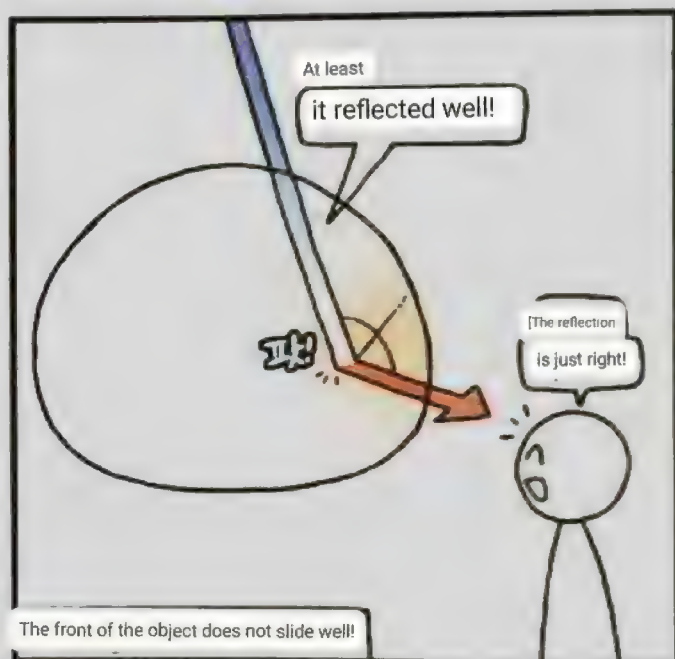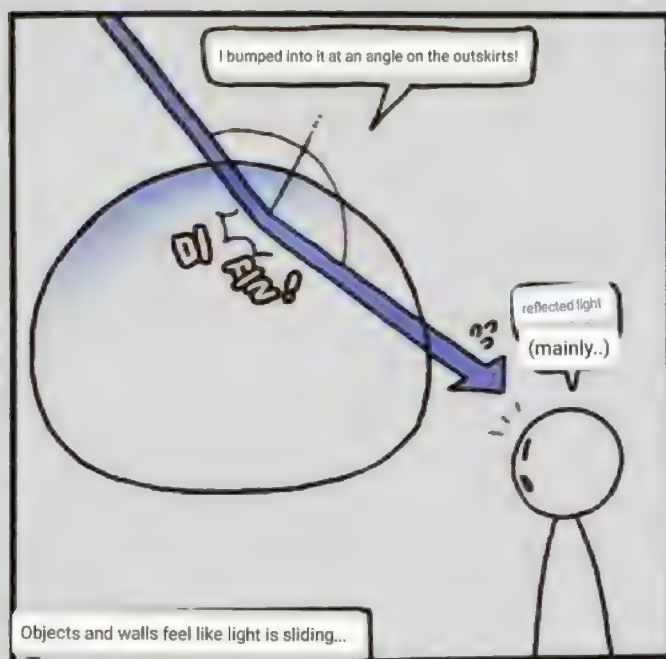
In some cases, rimlight lighting is installed to separate objects from the background in the picture. In addition to illuminating an object with strong backlight, a method is also used to maximize the reflection of light on the outside of the object by applying the Fresnel effect

[When coloring metal materials.

Try using it (color dodge synthesis)

4. Sub Surface Scattering (SSS)

When light shines on a transparent object

I know it's translucent, but...

Why is
<The light spread widely?

I switched to dot lighting...

I am the light

It has spread from inside the object!

When light passing through an object escapes to another location, it spreads brightly and diffuses inside the object, which is called subsurface scattering

When light scatters at irregular angles below the surface of an object, the transmitted color appears clearly in the object's shadow. The brightness

of the scattered light also varies depending on the illuminance of the light or the thickness of the material, and this phenomenon occurs in many layered materials

4-1. subsurface scattering in the shade

(apart from the surface reflecting light

7 Inside an object...

The red diffused light

<I feel like it's shining!/

Shadows
can also
cast shadows:
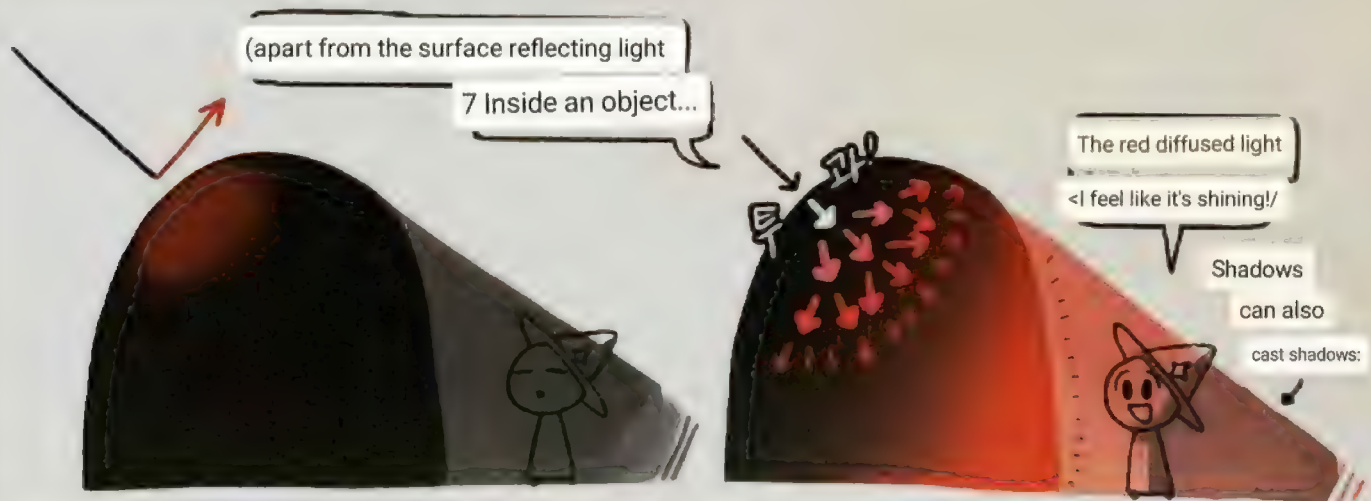
When light transmitted through an object is diffused inside, the object diffuses and emits light as if it were self-luminous. It can be

observed that the transmitted color of the object is diffused and illuminated in the shade where the object cannot be illuminated by the main light source

Materials that are not transparent

are <reflection only on the surface, but...

The transmitted light will be transmitted-colored light

independent of the surface reflection!

An object exhibiting subsurface scattering is

It acts as an indirect light that illuminates

shadows close to the object.

dig

I've seen enough, but...

(Hey, it's too dark...)

surface

Do you want light...

below the surface

It's bright enough for me too..!!

kaha! I will help!!!

Well, I have nothing to do with it either

In a layered material, the reflected light from the surface and the diffused light of subsurface scattering have a complex effect on the color of the object

Since the highlights are sufficiently brightened by the main light source, the transmitted color of subsurface scattering does not appear directly. The light

of the transmitted color stands out more than the effect of the main light source at the contrast boundary and shadow where the object color does not appear relatively well
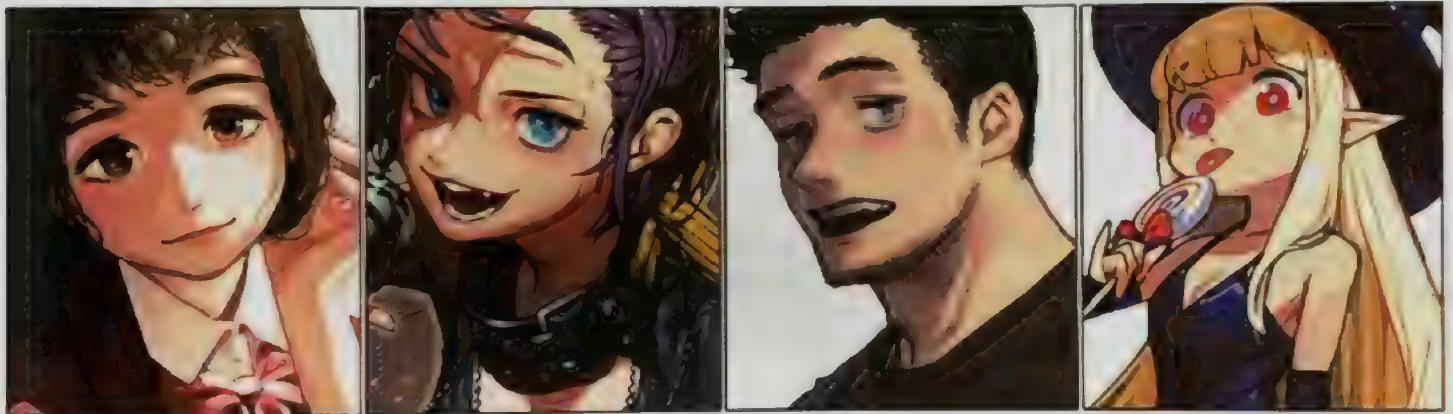
Human skin is one of the representative layered materials, and subsurface scattering can be observed when strong light is irradiated onto the skin. In addition to the

effect of illumination, a red color appears in the shape shadow or the contrast boundary depending on the color and thickness of the skin and the amount of

blood flow. Subsurface scattering is a phenomenon that occurs well when the conditions of roughness and material are met, so it is very often used when coloring human skin

[On non-permeable materials

1 to highlight the light

I write too!

Tal: Tip SSS

mask

Also.. the effect is certain

But too much can have

the opposite effect.

Only the role
of seasoning to the last!

(v)

(X)

► Compositing subsurface scattering with layer blending conditions

It is very effective to show subsurface scattering of the skin when expressing lively skin. Let's use the

layer blending condition to easily synthesize the red light that appears at the light and dark boundary.

I just painted the

surface of the object

create a new

layer ;

With an airbrush on

the contrast boundary

Paint it red!

(Skin expression is a pity for the route)

- Partial overcoating

is possible
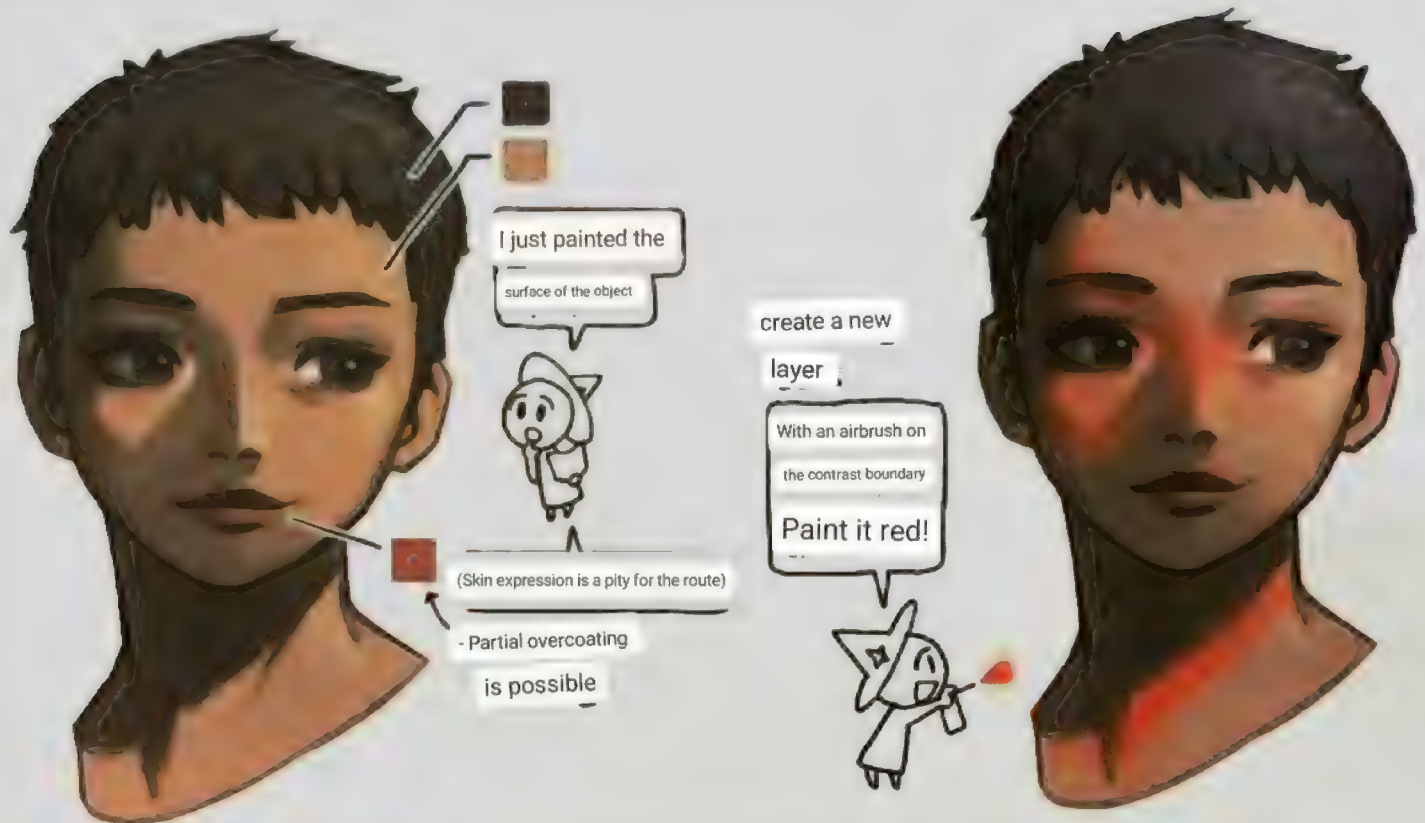
Since the glazing coloring method synthesizes only the color that appears on the surface of the object, the color caused by subsurface scattering must be additionally

described. Create a new layer for compositing and softly paint the red color on the light and dark borders

It would be easier

if I clipped it!

- We even give you the Myeongyang border!
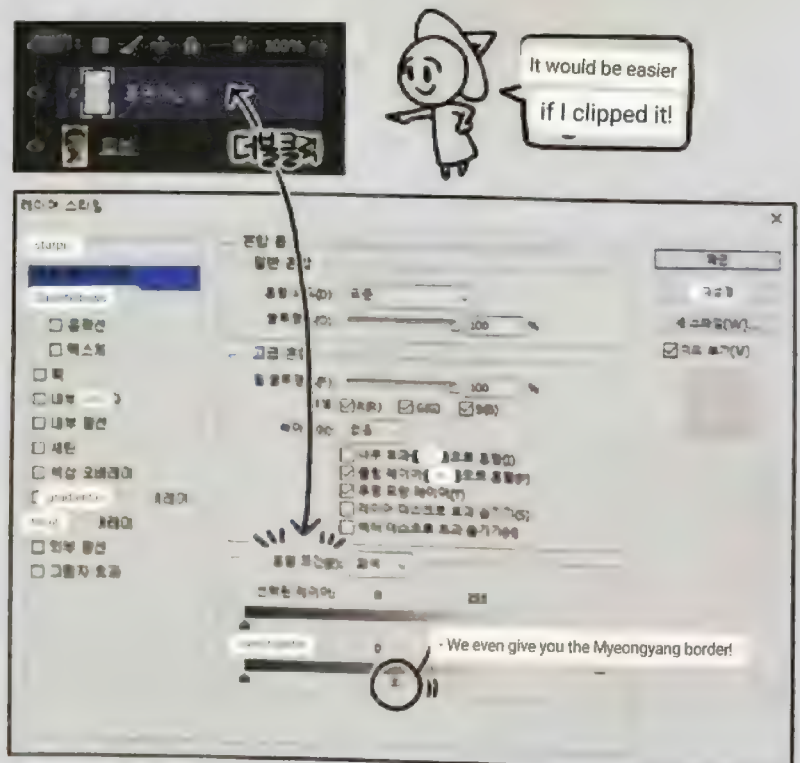
In the blending condition of the layer for compositing, move the slider of the layer gradation below so that the highlights do not appear

| Musset conditions (E) | grey | ✓ |

Selected layers:　　0　　　255

layer below　　0　　　115 / 189

Detach the slider by holding down the AI+ key!
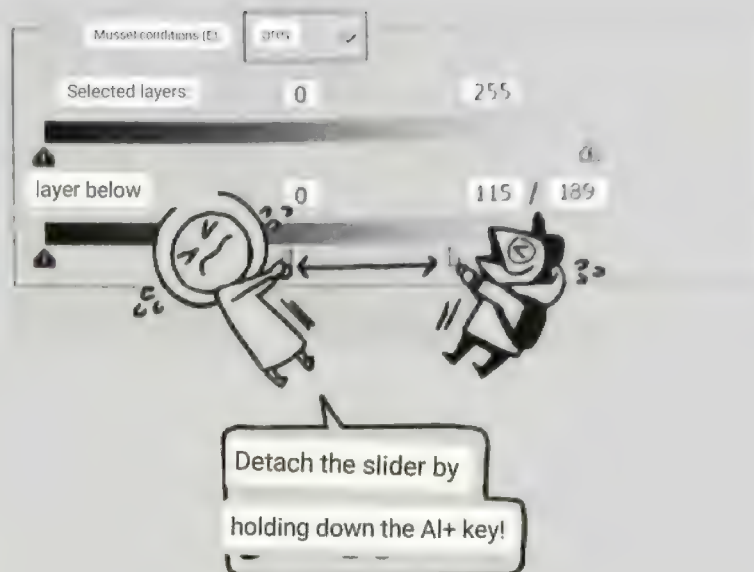
At this time, hold down the Ar key and move the slider to make the compositing smoother.

[Subsurface scattering is also 'First of all, because it is light, screen synthesis'

about 60%.

The layer blending condition -

is a method that is used in various places besides subsurface scattering!
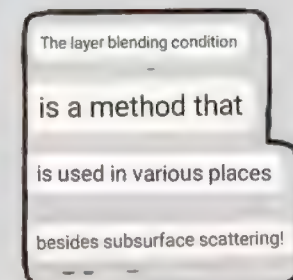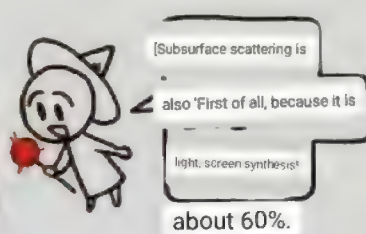
Tattoos, rainbow colors, etc... ○

Subsurface scattering can be expressed by compositing layers as screens or overlays.

Adjust the layer opacity to express the red color without being too excessive.

PART 06

color

HERE ON

1_Color

One day on an adventure...

phew. Now that I've revealed enough, it's color

wanna record it?

If you shine on it, it will eventually become a color
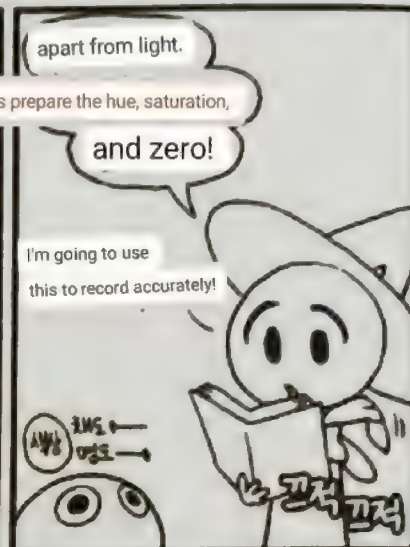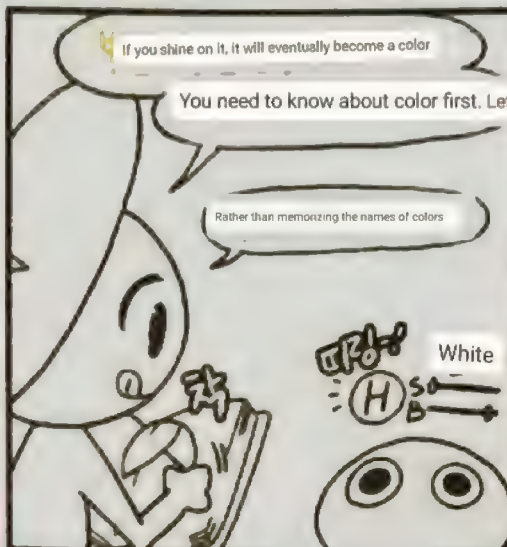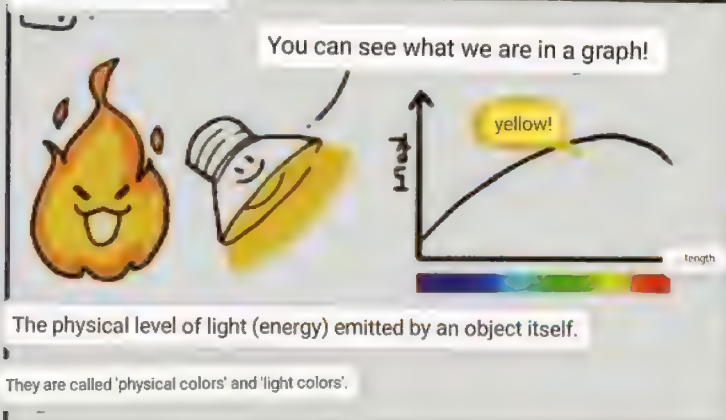
You need to know about color first. Let's prepare the hue, saturation,

Rather than memorizing the names of colors

White

apart from light.

and zero!

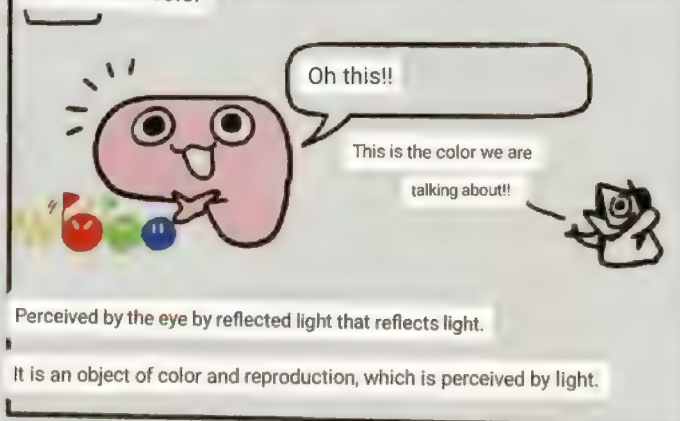I'm going to use this to record accurately!

When light illuminates the world, we perceive it as a color. Color is a subjective sensation that does not exist physically in reality. An image that expresses the appearance under the influence of light with accurate colors can effectively reproduce the intangible existence of light. Color is used in various meanings in some cases. Let's compare the definitions of some colors you need to know for coloring.

· Color mathematical color

You can see what we are in a graph!

yellow!

The physical level of light (energy) emitted by an object itself.

They are called 'physical colors' and 'light colors'.

color visible color

Oh this!!

This is the color we are talking about!!

Perceived by the eye by reflected light that reflects light.

It is an object of color and reproduction, which is perceived by light.

- The name of the color color.

"We're different, so let's give it a name!"

pink   turquoise   Red

A quality that distinguishes one color from another.

Most commonly, it is a concept used in many ways.

-Tone colored business cards.

hello. I am a dull red...

I am...
· Deep yellow...

The concept of integrating lightness and saturation among the three properties of color can be said together with the lightness and shade of hue (hue).
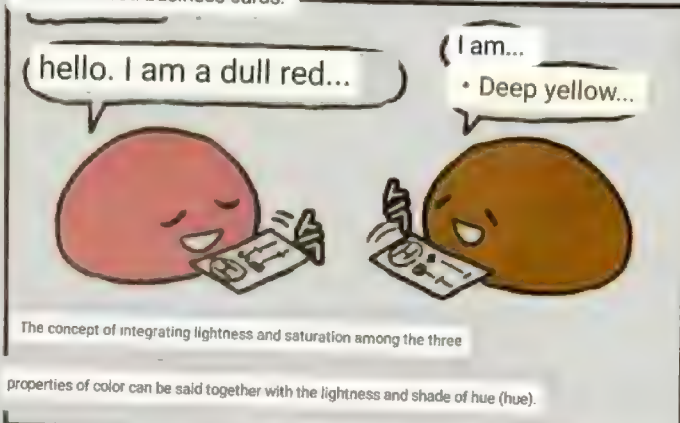
In other words, the color required for coloring is the most accurate expression of color, but we will call it a color intuitively

1. 조색(Color Mixing)

Panel 1: Color is different from light (should we handle it?') (Creating colors first) (Let's learn how!) It's called 'colouring'.

Panel 2: What kind of change will occur in toning using the three primary colors of color? red yellow dispatch

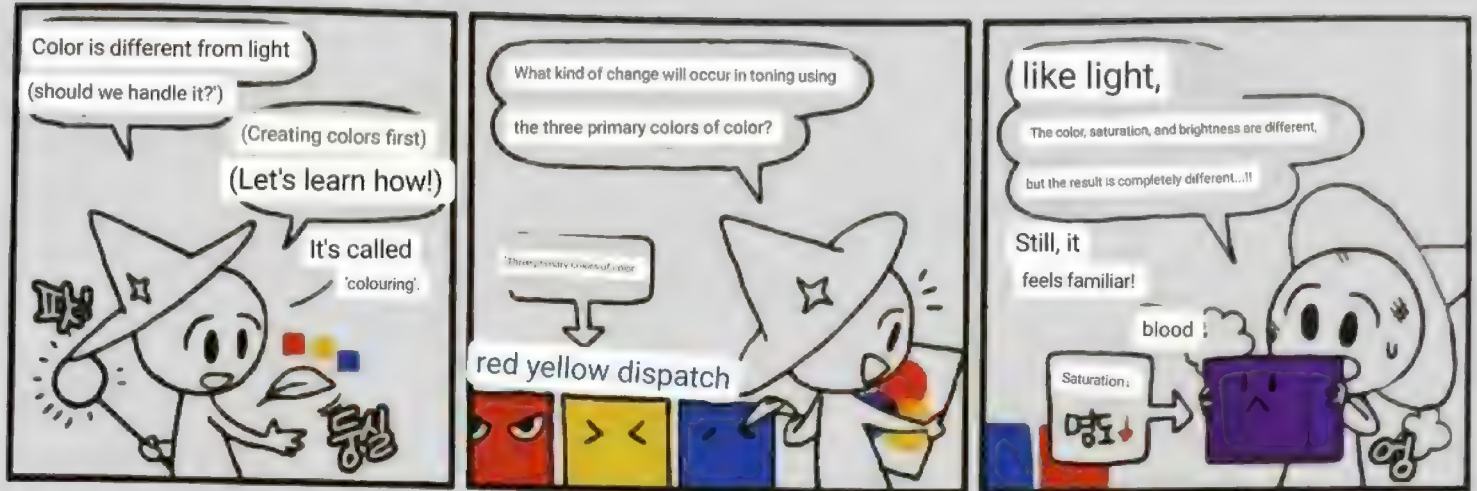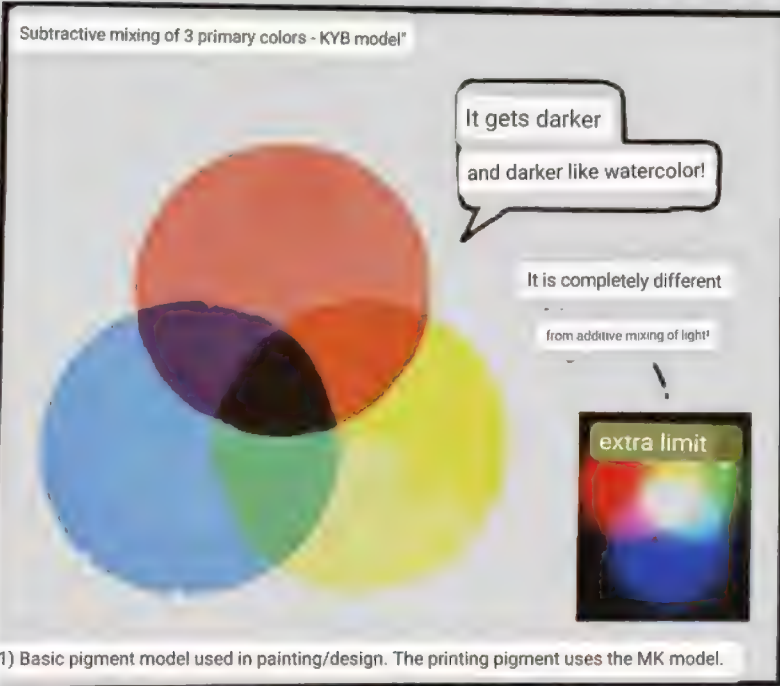Panel 3: like light, The color, saturation, and brightness are different, but the result is completely different...!! Still, it feels familiar! blood Saturation: 명도↓

Coloring a picture to express the appearance of an object is called coloring, and creating such a color is called toning. Toning involves combining pigments to create a desired color. Unlike light that is added and mixed, subtractive mixing occurs in toning. Let's see how the color properties change when subtractive mixing is used in the toning process.

Subtractive mixing of 3 primary colors - KYB model"

It gets darker and darker like watercolor!

It is completely different from additive mixing of light¹

extra limit

1) Basic pigment model used in painting/design. The printing pigment uses the MK model.

The three primary colors are called the three primary colors of color, and red, yellow, and blue are the three primary colors respectively on the color wheel

When pigments are mixed, the color gradually darkens and becomes black, so this mixing is called subtractive mixing. The watercolor technique is a representative example of subtractive mixing

Any color can be created by mixing the three primary colors of color

Medium

Blend (Medium Brightness:

Neither dark nor bright!

(subtract) (addition)

Generally, in digital coloring, transparency is added, resulting in intermediate color mixing. Unlike subtractive mixing, mixing with intermediate mixing adjusts the average brightness of the two colors. When mixing with intermediate blending, if colors with large differences in color are mixed, the saturation will drop significantly

Brightness adjustment is convenient, but saturation adjustment is difficult, so it is not a suitable method for 1 light expression

(Still, it's easier than traditional coloring..!!!

2. Properties and Use of Color

Each color has a different hue, saturation, and lightness. This value is determined through the interaction of light and objects.

However, since color is a subjective sense, you can color the picture a little more colorfully by using each attribute. Let's

learn how to use the properties of color to represent harmony or contrast in coloring.

① Hue

I see you often!!

depending on the color of the object and the wavelength of the light, the hue (hue) of the color to be painted is determined
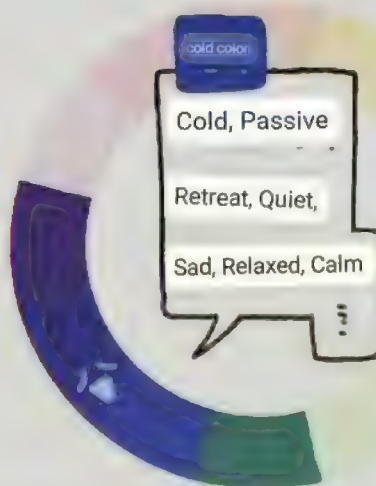
The stronger the illuminance of the light and the clearer the color of the light, the more affected by the color of the light

Since white light with an even wavelength of light does not have a specific color, only

the brightness and saturation of the object color are adjusted.

When light and object color are complementary, all of the light is absorbed by the object, so the color

of the object is not reflected, resulting in a dark color with saturation and brightness.

► Warm and cold colors

hot, aggressive,

advance, stimulating,

joy, anger, energy

Cold, Passive

Retreat, Quiet,

Sad, Relaxed, Calm

We definitely

Don't be like that

Warm colors and cold colors are representative examples of colors that people feel psychological
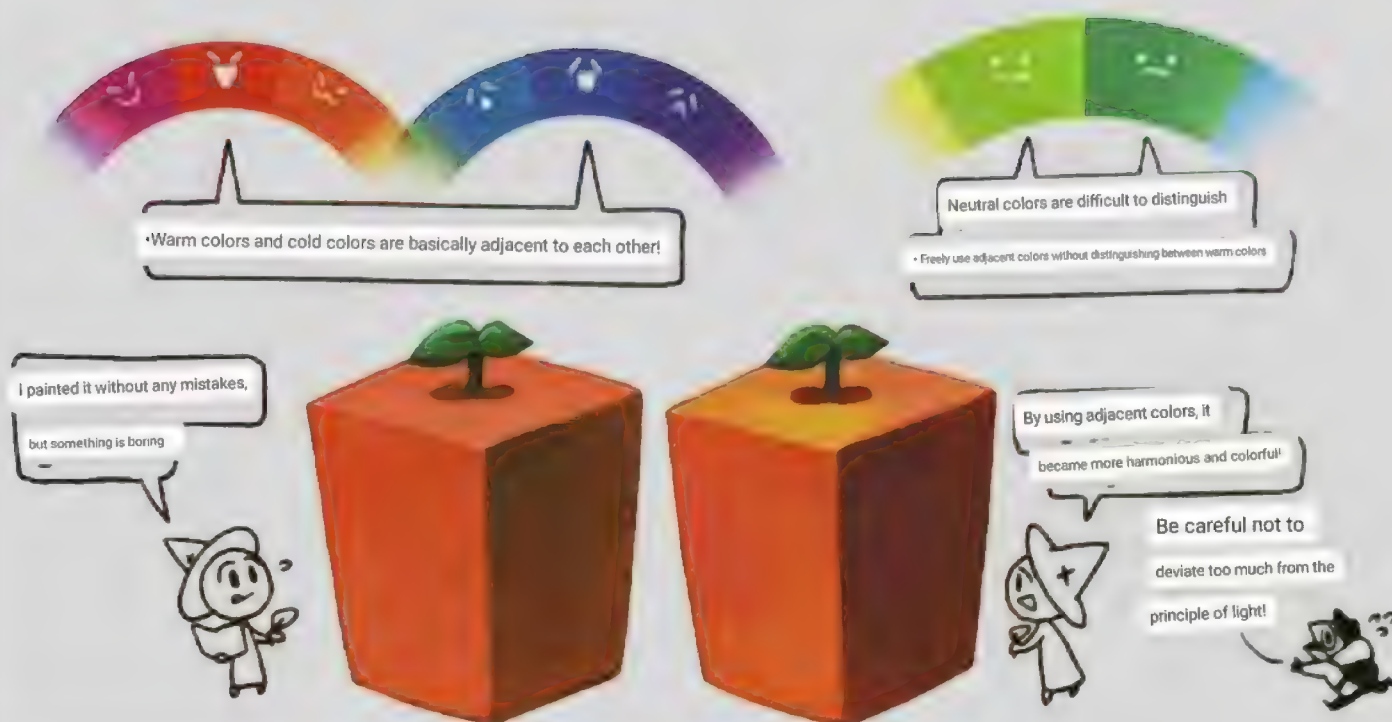
changes in. In natural light, the red wavelength of the sun stands out, making it red and yellow, and the sky has a soft color because the

blue wavelength is scattered. The red color that evokes the sun or flames is called a warm color, while the blue color that reminds us of water or ice

and snow is called cold. Purple and green feel warm or cold depending on the colors used together. These colors are called neutral

colors. When drawing an achromatic or neutral color-oriented picture, using warm and cold colors can psychologically give a difference in temperature

▶ Adjacent color harmony

·Warm colors and cold colors are basically adjacent to each other!

Neutral colors are difficult to distinguish

· Freely use adjacent colors without distinguishing between warm colors

I painted it without any mistakes,

but something is boring

By using adjacent colors, it

became more harmonious and colorful!

Be careful not to

deviate too much from the

principle of light!

The relationship of colors that are adjacent to each other on the color

wheel is called adjacency. Colors that are adjacent to each other harmoniously match each other, so you can try using adjacent colors in

flat colors. In particular, neutral purple and green have a very wide color range, so they can actively utilize their adjacent colors.

▶ Complementary color contrast

(The stronger the contrast,

the more eye-catching.

My complementary color

is turquoise!

I want to emphasize the color more...

·You should try using complementary colors a bit!

"I've already adjusted the saturation .

Also used together...

The relationship between colors opposite each other on the color wheel is called a complementary color relationship

Colors that are complementary to each other maximize the contrast between the two colors and play a role in emphasizing each color. Complementary

colors are sometimes intentionally used to further emphasize colors in their achromatic relationship with certain colors. "The intuitive

complementary color contrast of two colors can give a childish feeling, so I sometimes use adjacent complementary colors that use adjacent colors of complementary colors together.
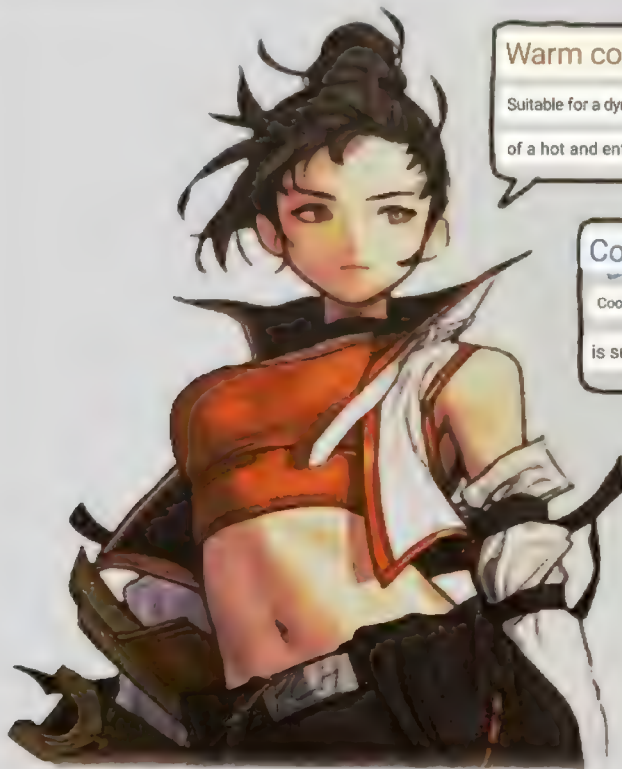
I think it's good that you can use colors freely compared to the light!

Let's observe the difference by using various colors!

[Hue is the most subjective property of color, so it can be used in a variety of ways!

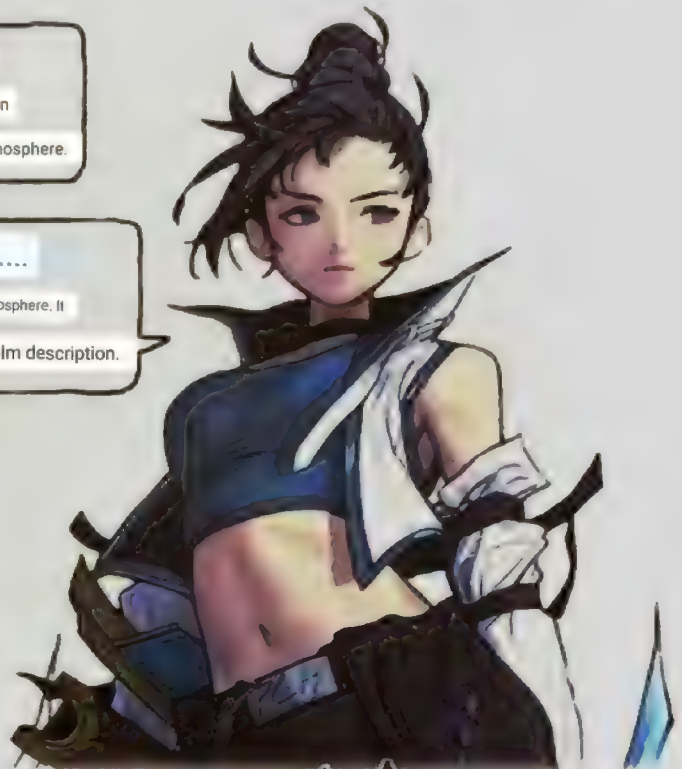Warm colors and white are often used to adjust the overall mood of an image.

Warm color 00

Suitable for a dynamic depiction

of a hot and enterprising atmosphere.

Cool color....

Cool and quiet atmosphere. It

is suitable for calm description.

Alternatively, it is used to express the temperature difference between highlights and shadows

coloring

Basic color

In fact, natural light

The color contrast between the words of the tree and the cold sky appears

If you use the harmony of adjacent colors, you can color the colors that would otherwise be simple to paint more colorfully.

It is not a change in color due to light, so be careful because excessive color matching can reduce the realism of the picture.

To emphasize a specific color, contrast of saturation is most commonly used, but you can emphasize the color more by using the complementary color of the accent color

Adjacent color matching

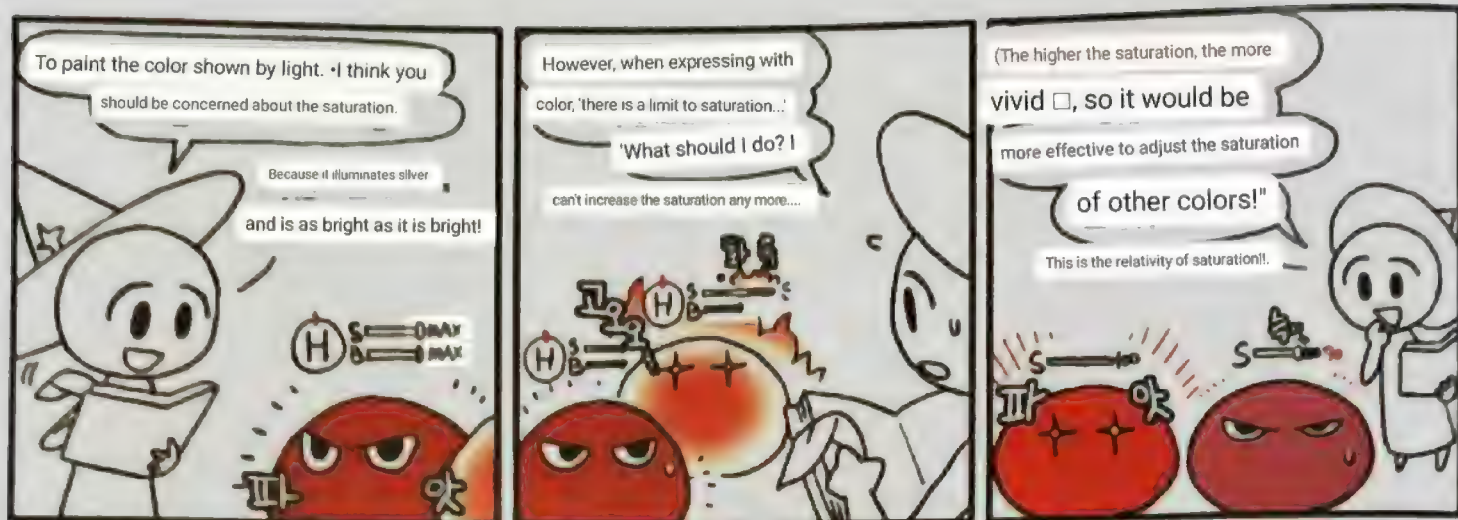As it is the most color-down property among the properties of color, various uses are possible!

It's bright

It would be even better if you check the value and color it~
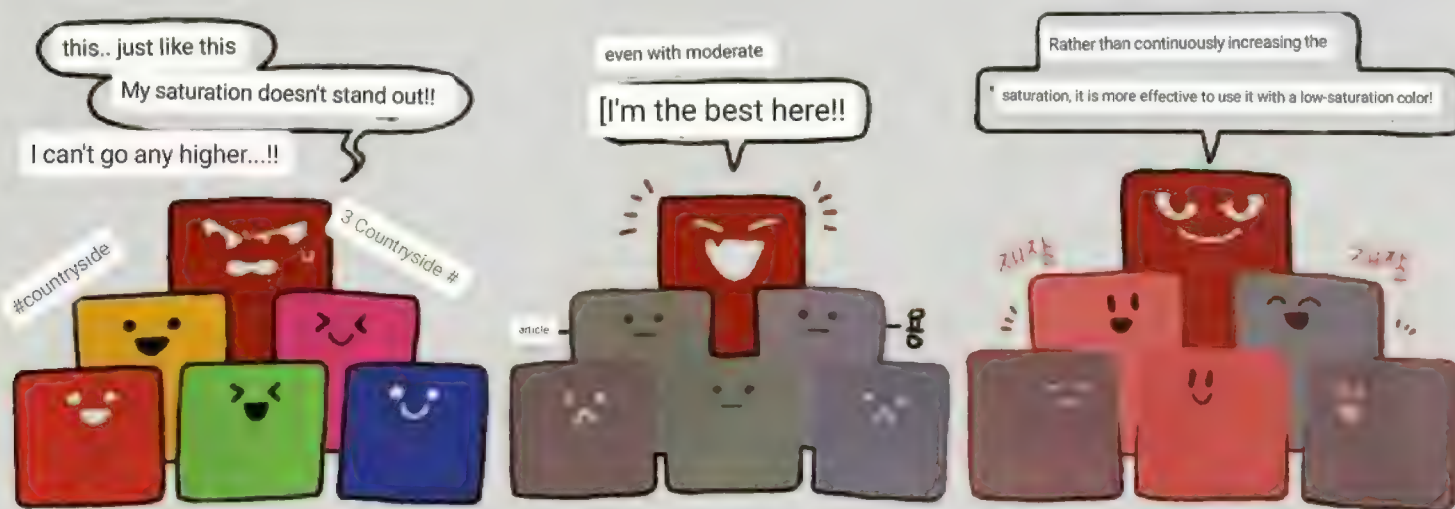
Each color has its own unique brightness.

② Saturation

To paint the color shown by light. ·I think you should be concerned about the saturation.

Because it illuminates silver

and is as bright as it is bright!

However, when expressing with color, 'there is a limit to saturation...'

'What should I do? I can't increase the saturation any more....'

(The higher the saturation, the more vivid □, so it would be more effective to adjust the saturation of other colors!"

This is the relativity of saturation!!.

Objects brightened by sufficient illumination will have a highly saturated color. Adjusting the saturation is as important as the brightness in the expression of light. However, unlike light that is added and mixed, there is a limit to the expression of color saturation, so it is impossible to color with more vivid saturation than a certain number. It is important to take advantage of the relativity of saturation, which makes the color appear more vivid when compared to a color with relatively low saturation
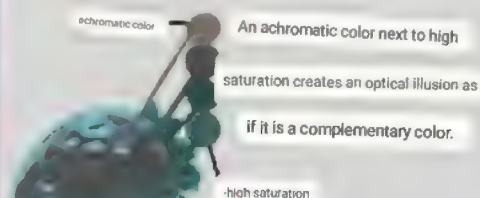
▶ Relativity of Saturation

this.. just like this
My saturation doesn't stand out!!
I can't go any higher...!!
#countryside
3 Countryside #

even with moderate
[I'm the best here!!
article

Rather than continuously increasing the saturation, it is more effective to use it with a low-saturation color!

Saturation, which refers to how vivid a color is, is characterized by the fact that a color stands out more when it is next to a relatively dull color. Also, colors with very vivid saturation do not stand out well compared to colors with high saturation. This is called the relativity of saturation, and since there is a limit to the saturation that can be expressed in coloring, this characteristic must be utilized
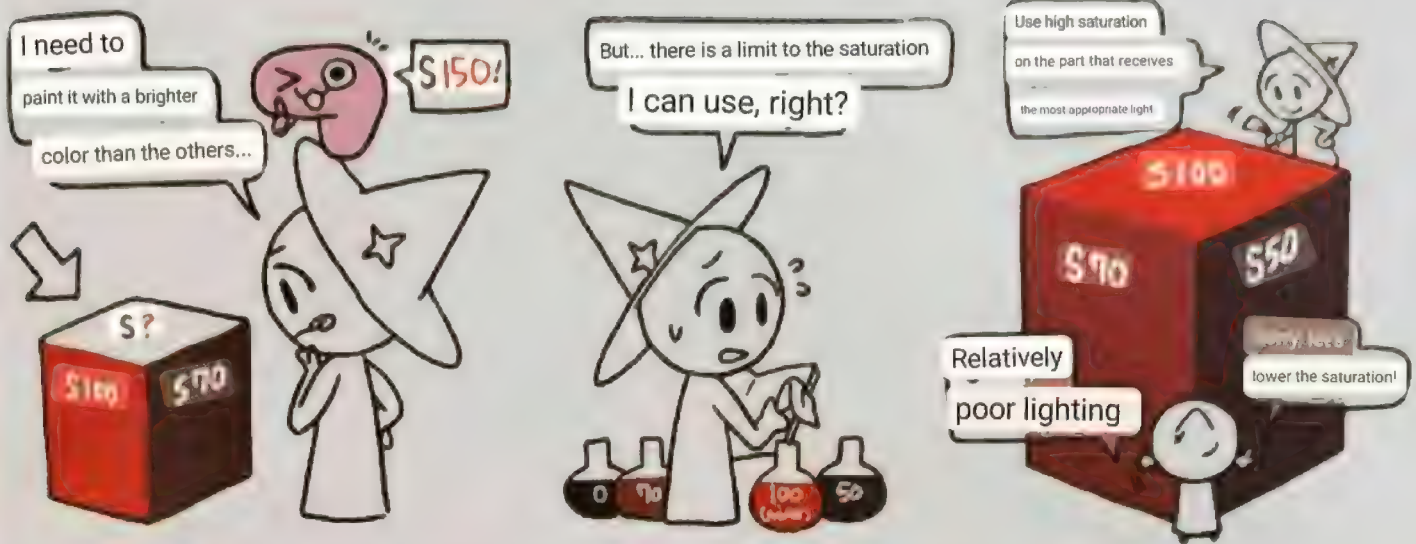

low saturation

If the distribution of saturation is applied in reverse...

achromatic color
An achromatic color next to high saturation creates an optical illusion as if it is a complementary color.
·high saturation

Dramatically exploiting the relativity of saturation, an optical illusion of the appearance of complementary colors to adjacent achromatic colors can occur

► Saturation control - Saturation is emphasized with light.

The more vivid the color, the better the expression of light, so emphasizing the saturation is a way to emphasize the expression of light. However, compared to the color saturation that can be perceived by the eye, the saturation that can be reproduced by coloring is quite limited. If the color of the contrast boundary is displayed vividly, the color of the highlight will be brighter and it will be closer to white, that is, achromatic color. In order to color the highlights as vividly as possible, it is necessary to reduce the saturation of shadows and contrasting edges with relatively low illumination. However, since brightness and value are objective properties compared to color and saturation, when adjusting the saturation, it is necessary to pay attention to the change of light and shade as well

► High chroma picture and low chroma picture

Ā There is a characteristic that it is difficult to intuitively recognize the difference compared to the properties of other colors. Overall, highly saturated and colorful paintings are good for expressing a splendid atmosphere through color harmony and contrast. Conversely, a low-saturation picture is advantageous for realistic expression of light and shade, instead of showing the subjective atmosphere created by color well. In fact, if you observe the world, you can see that the degree of saturation also varies greatly depending on various lights
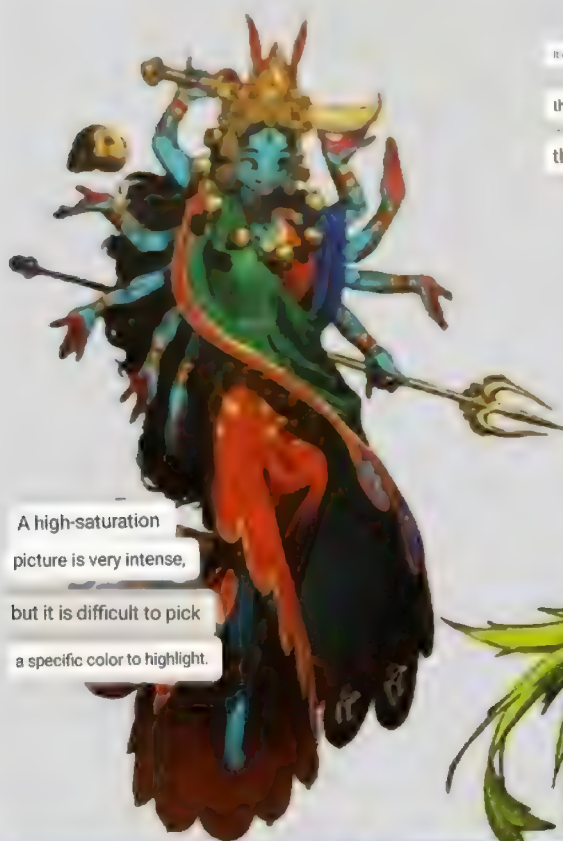
Compared to the properties of other colors, it definitely feels difficult to handle.

Is it because there is a limit to saturation, and adjusting the saturation itself is unfamiliar?

To control saturation well, you must understand the relativity and value of saturation.
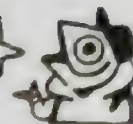
If you want to emphasize the color of a specific color, it is effective to use the relativity of saturation to color
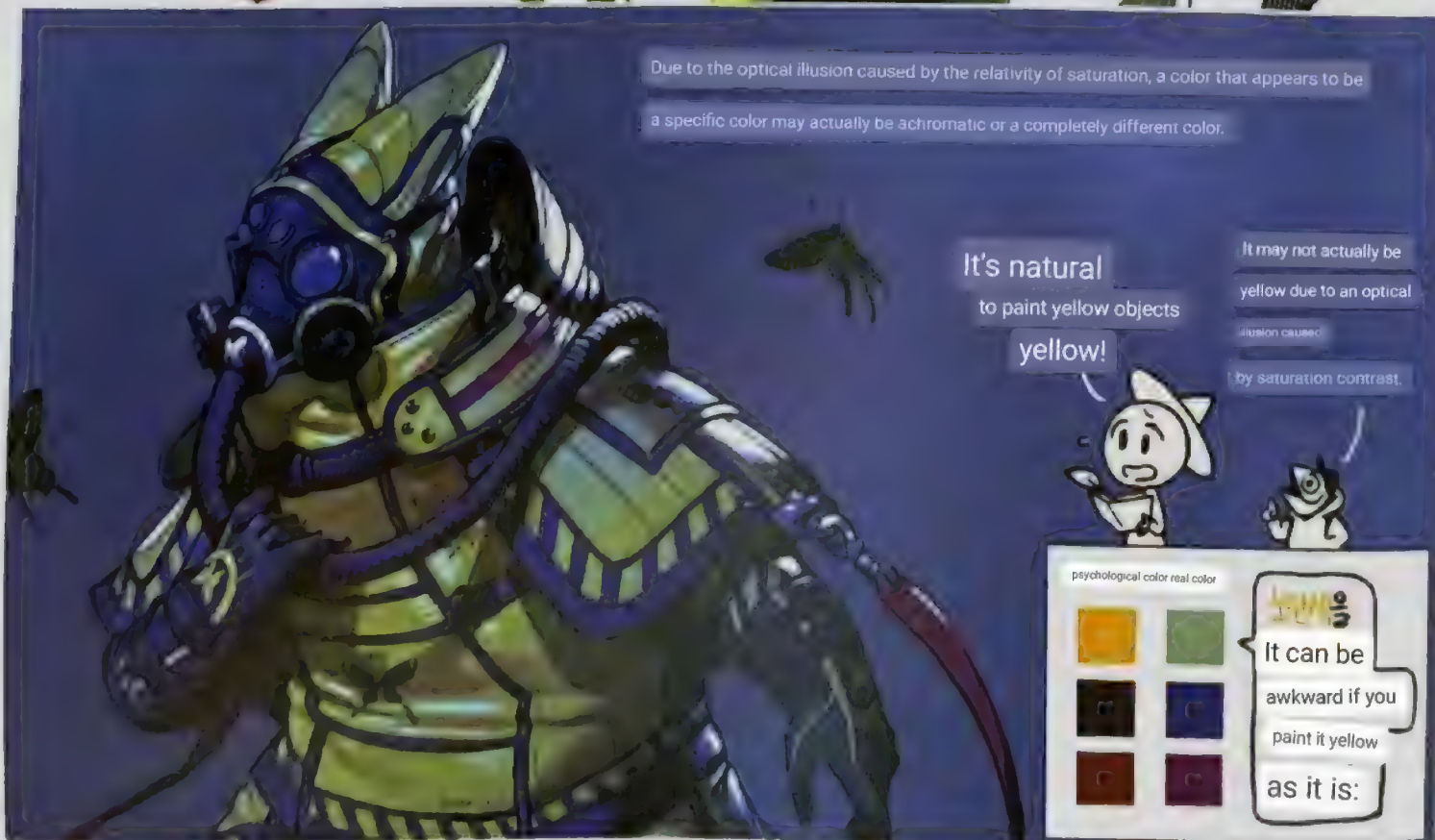
It emphasizes the light by expressing

the color of the part receiving

the light with high saturation...

The color of the drawing

paper or objects with relatively low saturation

is colored with a color of low saturation

to emphasize the color.

A high-saturation

picture is very intense,

but it is difficult to pick

a specific color to highlight.

Due to the optical illusion caused by the relativity of saturation, a color that appears to be

a specific color may actually be achromatic or a completely different color.

It's natural

to paint yellow objects

yellow!

It may not actually be

yellow due to an optical

illusion caused

by saturation contrast.

psychological color real color
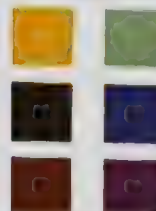
It can be

awkward if you

paint it yellow

as it is:

In the appropriate light, the saturation of the highlights is the highest, but there is a limit to the saturation, so I lower the saturation of the contrast and shadows to color

However, it should be noted that the value should not change while adjusting the saturation.

In high-saturation paintings, the lively emotions created by colorful colors stand out,

and in low-saturation paintings, the subjective feeling is not well expressed, but the realistic expression by contrast stands out

Clear and lively atmosphere!

Relatively insensitive atmosphere...

' Rather than sticking to only low- or high-saturation colors when coloring, it would be better to practice expressing various chroma differences depending on the light or atmosphere!

It is often used because high-saturation colors are easy to read.

To use colors properly, it is effective to use chroma contrast.

Color matching with high saturation is more difficult than with low saturation

③ Brightness

For classifying the brightness of a specific color (Hue)!

when the light shines

The brighter the color, the higher the brightness.

This is no wonder!

B100

B60   B20

The brightness of the color (hue) that is brightened by the light is called brightness. The final brightness of color is not classified by brightness, but by the concept of value by hue, saturation, and brightness

Brightness is most directly related to the value among the three properties of color, but even if the brightness is the same, the value may be different depending on the color and saturation

It should be noted that brightness and value are different concepts,

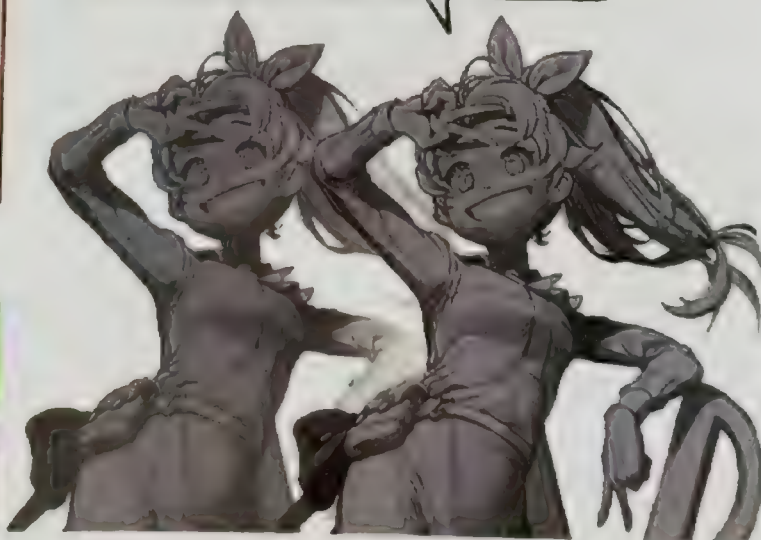Let's see how brightness is used in coloring.

(We are all at maximum brightness (B100%)~

(The brightness of color is <value!)

Let's not get confused!

▶ Gradient

0%   100%

Intuitive gradation appears compared to hue and saturation.

The richer the gradation, the more detailed shadows can be colored!

As the difference between light and dark brightness increases, the boundary between highlights and shadows becomes clearer, making the three-dimensional shape stand out. The stage of changing from one color to another is called gradation, and among the properties of color, lightness shows the expression of gradation well. The greater the difference in brightness between the two colors, the richer the gradation appears, and the smaller the difference in brightness, the fainter the gradation appears. With a relatively rich gradation, more detailed shadows can be colored, and a three-dimensional and realistic structure can be expressed.

► Tone

Youngdo
(B)

흰

light

Used for list or specular

bright ash

cloudy

bright

clear

stale

dark 함-

dark

thick

black

dark

used for shadows

Saturation(3)

The concept of integrating the brightness and saturation of a particular color is called

hue. When recoloring by changing the brightness and saturation of one scale
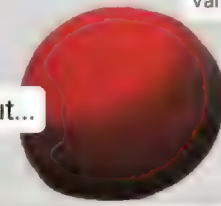
If you use various shades to color,

you can express various colors without changing the color.

ex)

It's
not bad
either, but...

Various gradation changes

make the colors colorful!

Brightness gradation (4 tones)

Myeong-Saturation Gradation (6 shades)

► Low key, High key

Basically, the brightness of a color is

It is determined by the illuminance of the light,

To create the mood of the painting

•In general, you can color with a focus on high/low tone tones!

objective

Rather than changing the properties of light

how to use color

pectoral

This is the realm of directing!

The brightness of a color is determined by the illuminance of the light, but the brightness of the overall color is intentionally adjusted to create

the atmosphere of the picture. A painting painted in a low-brightness tone as a whole is called low-key, and a painting painted in a high-brightness

tone is called high-key. Low-key's paintings have a gloomy and heavy atmosphere, while High-key's paintings have a bright and light atmosphere

It's been

valued since before...
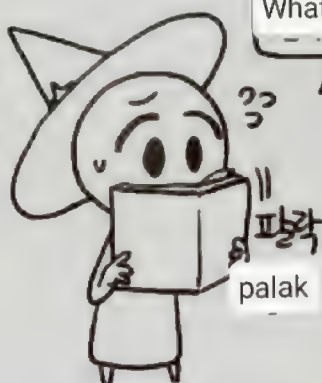
What is the value?!

(H) I wasn't even in 18!"

The most important concept in color is value, but before looking at

the value, it is necessary to know the three properties of color first.
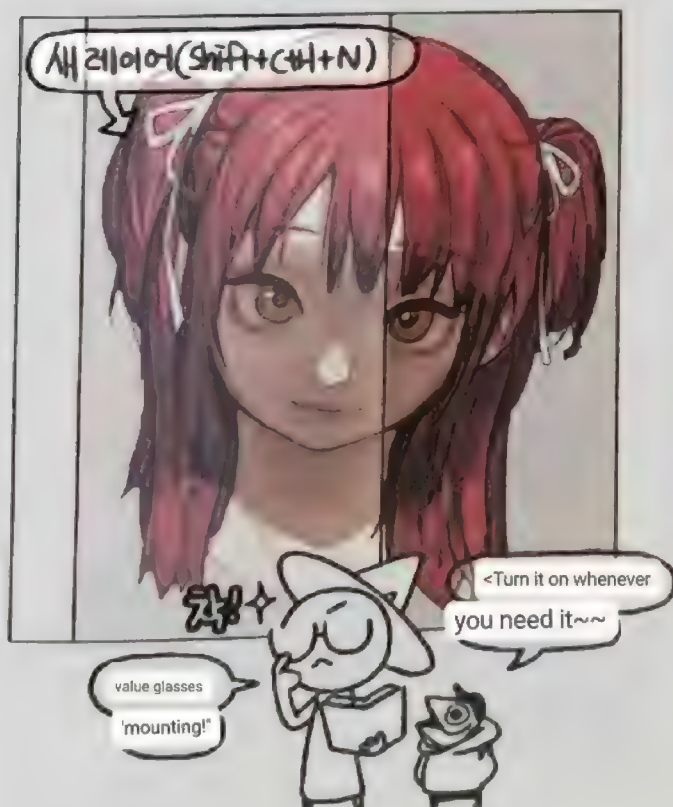
It is relatively easy to understand.

palak

④ Value

(Coloring cannot be used perfectly with color properties (hue, saturation, lightness) alone.."

Saturation/salinity is the same, but the brightness of the color is different!

If light plays a role in controlling the properties of color...

Let's change the color, color 5, and brightness!

color blue blue

The brightness of the color created due to its properties,

(Value is the most important thing!

I can't confirm this intuitively, but...

V85   Q40

Value is the final brightness of a color that appears according to the color's hue, saturation, and lightness. It is very

important to distinguish and determine the value when coloring light and shadow with various colors. Since

the value is not an absolute number for a specific color, it is difficult to determine intuitively.

Instead, if you understand and color these values well, you can color the world with more colorful colors than it really is.
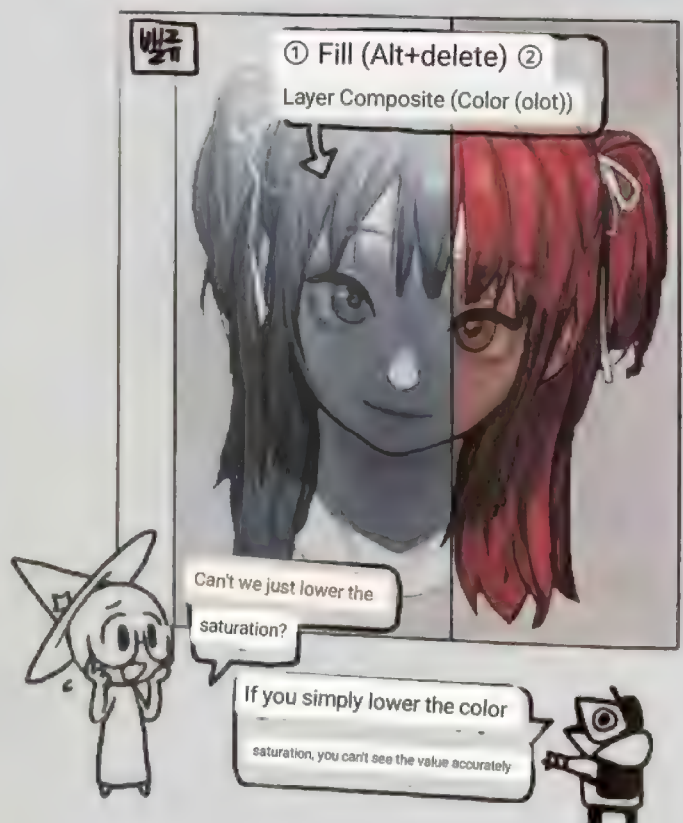
► Check the value

When toning in digital painting like Photoshop, you can't adjust the value directly because you adjust the color, saturation, and

brightness. Let's see how to easily view a picture as a monochrome image using the layer blending option.

① Create a new layer.

② Paint white and combine with color.

새 레이어(Shift+Ctrl+N)

<Turn it on whenever you need it~~

value glasses 'mounting!'

① Fill (Alt+delete) ②
Layer Composite (Color (olot))

Can't we just lower the saturation?

If you simply lower the color saturation, you can't see the value accurately

► Hue and Value

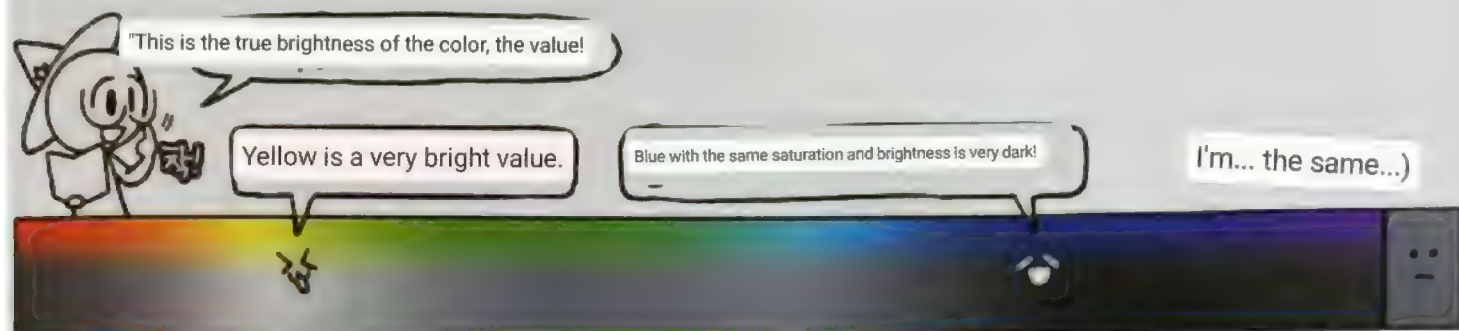We are the color with both saturation and lightness at maximum (100%)!

(It's called purecolor!)
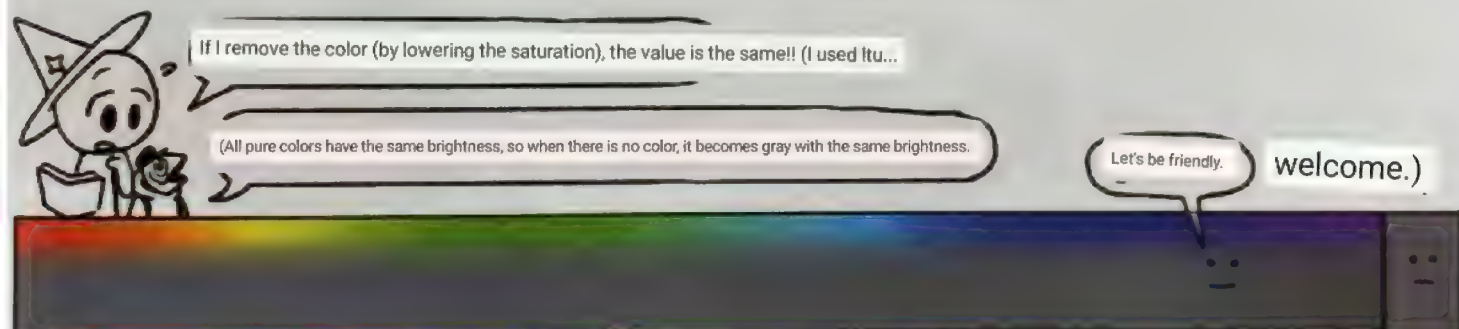
..just achromatic...)

An achromatic color without any color (gray) has a value in terms of brightness, but the value of a color that is bright and pure is different

for each color. A bright and pure color refers to a pure color with no achromatic colors mixed with the maximum color saturation and brightness

"This is the true brightness of the color, the value!

Yellow is a very bright value.

Blue with the same saturation and brightness is very dark!
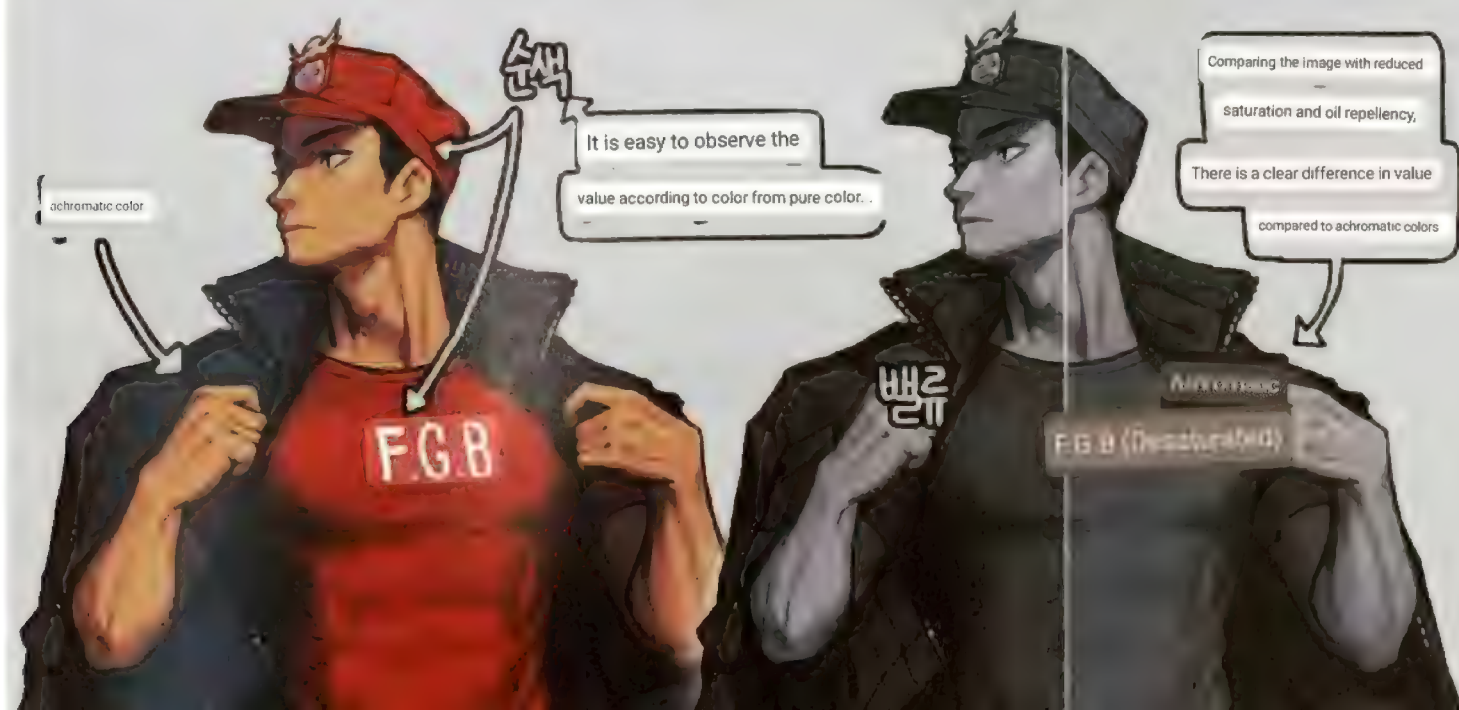
I'm... the same...)

If you check the value of a pure color, you can observe that there is a difference in the value of each color

Yellow has a very bright value and blue has a very dark value, so the two colors look completely different grays.

If I remove the color (by lowering the saturation), the value is the same!! (I used Itu...

(All pure colors have the same brightness, so when there is no color, it becomes gray with the same brightness.

Let's be friendly.

welcome.)

All pure colors have the same brightness, and each color has a fixed value, so if you lower the saturation, they all become the same gray

achromatic color

It is easy to observe the value according to color from pure color. .

Comparing the image with reduced saturation and oil repellency,

There is a clear difference in value compared to achromatic colors

F.G.B

Achromatic

F.G.B (Desaturated)

Can you see the value?

yellow is

미래는

Even if there is no color in red, the 23 value is very similar!

The more colors are mixed

The relationship between color and value fades.

(achromatic color)

(Brightness is value...

Because there is no color (the value is similar to blue...

Among the three primary colors, yellow and blue have a very large difference in value from a color with reduced saturation, while red has a relatively small difference

The color of the secondary color mixed with 3 primary colors has a smaller difference, and the value of the achromatic color (gray) with all the colors is the value

i am red

i am yellow

(Too complicated!!)

(It's quiet here...)

"I. Doran

Maybe it's red...

Doran

(Yes, I am yellow...

The clearer the color, the more pronounced the difference in value by color, so you need to pay attention to the value, but

since the color with low saturation has relatively little difference in value by color, it goes well with each other regardless of color.

The saturation is so high that it seems difficult for us to get along

It may be slightly different from the actual color, but...

If possible~ Yogi · I paint with the correct color!

Oh, you too...

Hello...?

(You can paint it any color

The value of the color becomes a very important attribute when choosing a color because the brightly lit highlights increase the color saturation.

On the other hand, shadows that cannot be lit by light are colored with colors with relatively low saturation and

brightness, so you can freely color them with a variety of colors using similar or achromatic colors.

▶ Brightness and Value

What can we do to get to know each other?

Now the values are pretty similar!

brightness

Value is the answer!

this is real

Color writing fun!

Each color has a different value, so in order to unify the values of colors with opposite values, you need to adjust the color brightness. In order to use yellow harmoniously with other colors, it is necessary to lower the brightness of the color considering that the value of the color is very bright. Conversely, blue has a dark value, so you need to increase the brightness. The pure blue color is already at maximum brightness, so we desaturate it

pure color!!

That is, coloring is...

- Where a color is needed

2. Checking the value

3. Adjust the color properties

4. Paint subjective colors!

If you adjust the colors to have similar values, you can color using all the properties of colors, from pure colors to achromatic colors with opposite values. In other words,

the value of each color is different, the value of the color stands out according to the saturation, and the brightness of the color is adjusted when the value

is adjusted. If light determines the objective properties of color, coloring is to use subjective colors by adjusting the values

[Value is not a property of color]

It is very difficult to

know how to handle it...!!

- Forgetting the properties of color (hue, saturation, lightness) for a while and practice coloring with a 'subjective color'

(Let's do it!!

You need to develop your

sense of color!

► Value application color solid color

Unlike the hue/scale/brightness of a color, value is a property that cannot be directly controlled, so the colorer's sense is required. Sometimes different values appear for each color, and sometimes colors with completely different properties appear with the same value. Let's forget the properties of color for a moment and practice determining the color by checking only the value of the color

Fill the canvas with a random color and create a new layer to check the value.

Change the layer blending option to color and fill it with white.

👁 Shows the layer's visibility.

This is the layer to color in earnest. Fill it with any color.

• New layer

Equipped with value glasses!!

As it is an exercise to develop the sense of color, you should choose colors while observing only the flow.

Keep wearing it if possible

Only the value of the colored layer is checked and recolored with a random color. It is convenient to change the settings of the eyedropper

I don't know exactly what color it is, but the difference in value can be observed."/
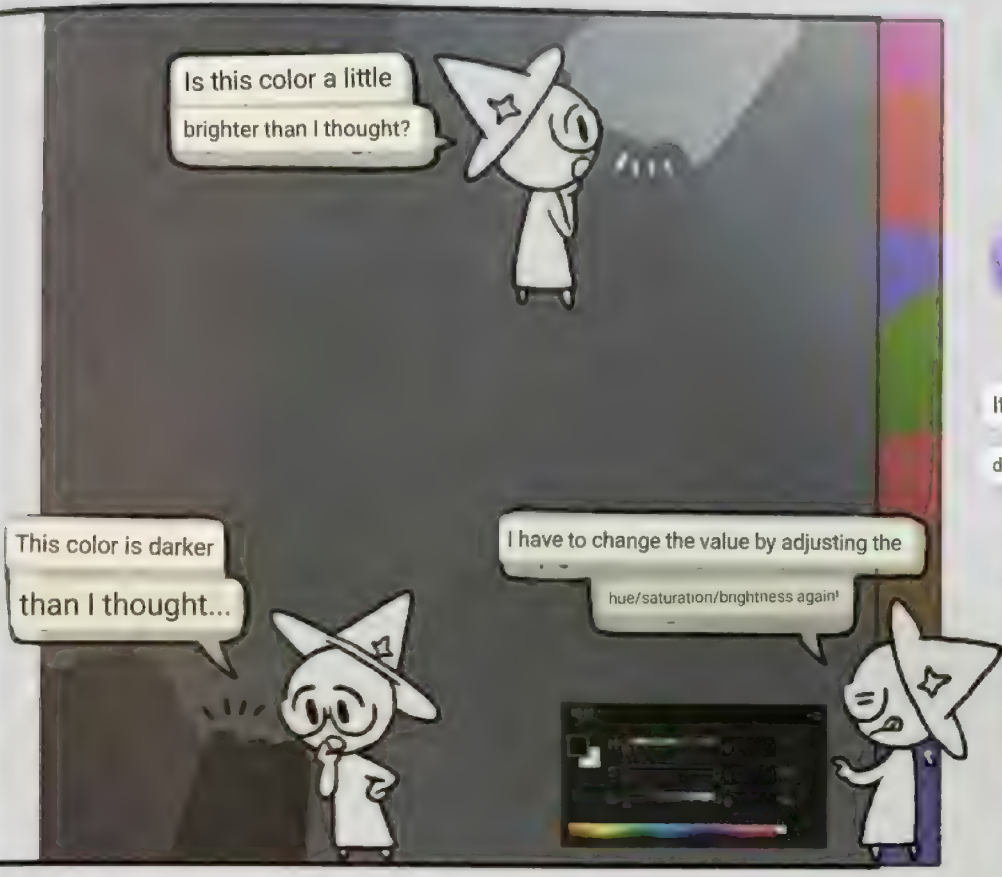
Ignoring the value check layer

Extract the color of the coloring layer.

Choose your own color or...

You can colorize by adjusting the color properties.)

Is this color a little brighter than I thought?

This color is darker than I thought...

I have to change the value by adjusting the hue/saturation/brightness again!

Use the brush freely.

SOFT HARD

It can be practiced more intuitively by directly mixing the colors rather than mixing them.

Mixed colors sometimes have values that are coincidentally correct

Try increasing the brush opacity!

If you turn off the visibility of the value check layer, you can see the bees have a constant variety of colors

Turn off layer visibility.
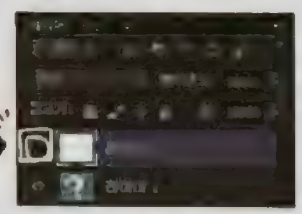
[The color properties are all different, but they don't stand out and go well together!

▶ Value application coloring - gradation

By applying the fact that each color has a different value, let's color the gradation that changes the value gradually.

Rather than simply adjusting the brightness of a color, it is better to adjust the hue and saturation at the same time
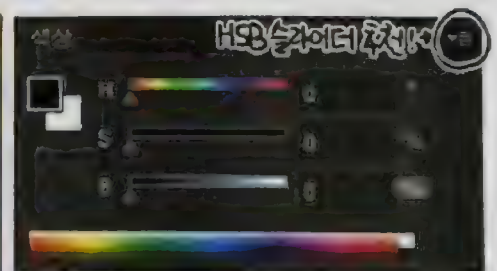
① Create a gradation using two random colors with different values, and create a value check layer.

The richer the gradation of the value, the more different colors you can use!

Press and hold →
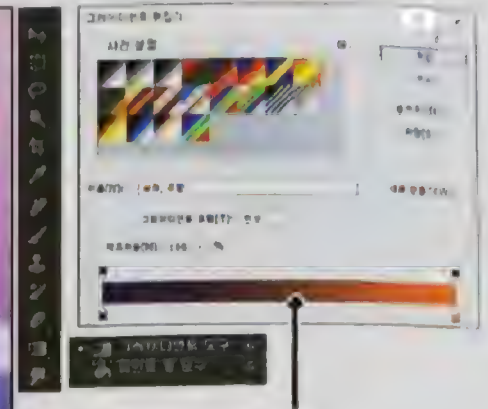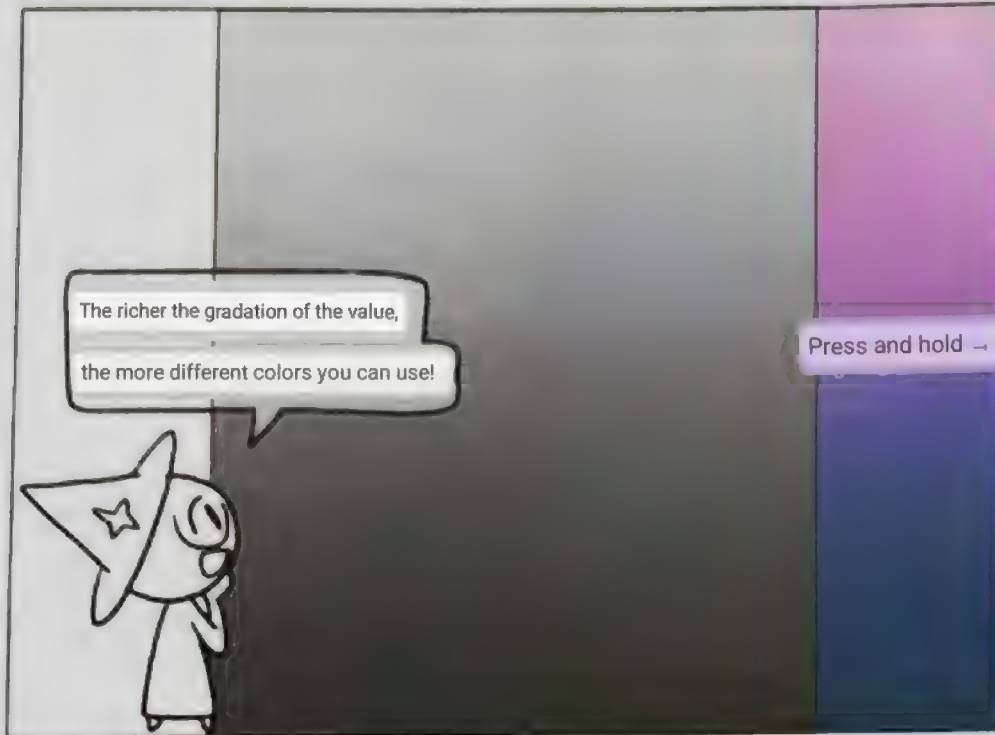
The more different the properties of the two colors, the richer the gradation appears

② Similarly, color with any color, but with a color that does not deviate from the existing gradation.

I like this color for this value!

Where do you paint this color 1?

Let's select a color by directly adjusting the color properties (hue, saturation, brightness).

When color matching and deciding

I'm going to focus on the value rather than the attribute of color!

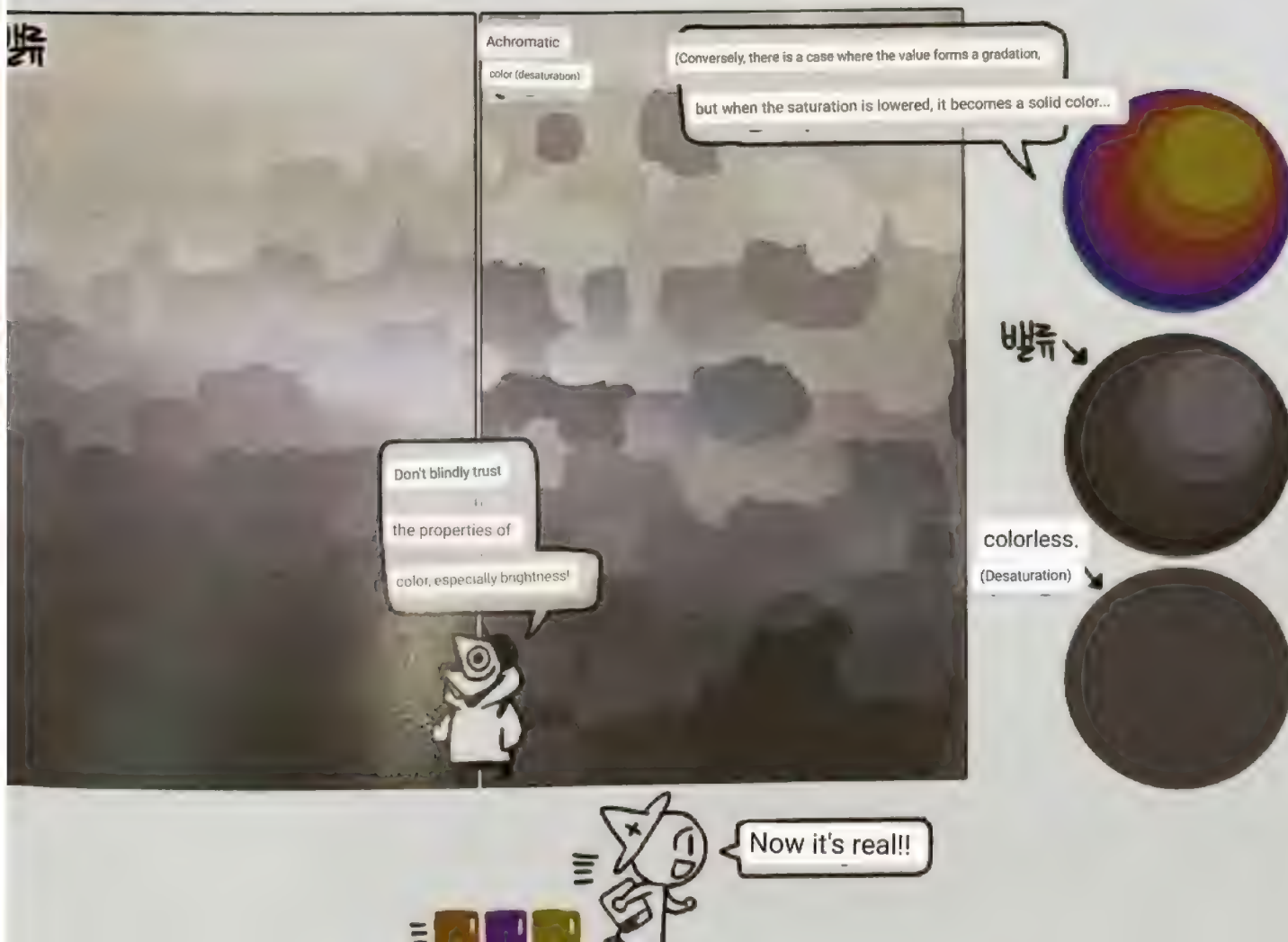I'll have to get used to it...

The first time you try it, it will take longer than you think!

Turn off the visibility of the value check layer, and check whether the values of various colors form a natural gradation.

In the form of chromatic colors, relatively high-saturation colors stand out, but in the coloration, especially the expression of light, the classification of values is a priority

before the color

bright and dark

must be expressed!

Although it is not possible to check the value intuitively...

11 Creating gradations of values with various colors helps to develop a sense of color!

It can be seen that the value of color is very different from the achromatic color with the desaturated color

Achromatic color (desaturation)

(Conversely, there is a case where the value forms a gradation, but when the saturation is lowered, it becomes a solid color...

Don't blindly trust the properties of color, especially brightness!

colorless.

(Desaturation)

Now it's real!!

▶ Value Applied Coloring- Light and Shadow ①

The color of the highlight and shadow created by light and objects has a rich gradation of value.

Based on the color displayed by light, let's color the light and shadow with various colors, paying attention to the value

① Achromatic light is applied to an achromatic object, prepare an achromatic picture, and create a value confirmation layer

A sharp shadow with a large contrast between the highlights and shadows is recommended.

value

colorless.
Is the value 1 the same?

Since there is no hue and saturation, the value of the color is as it is.
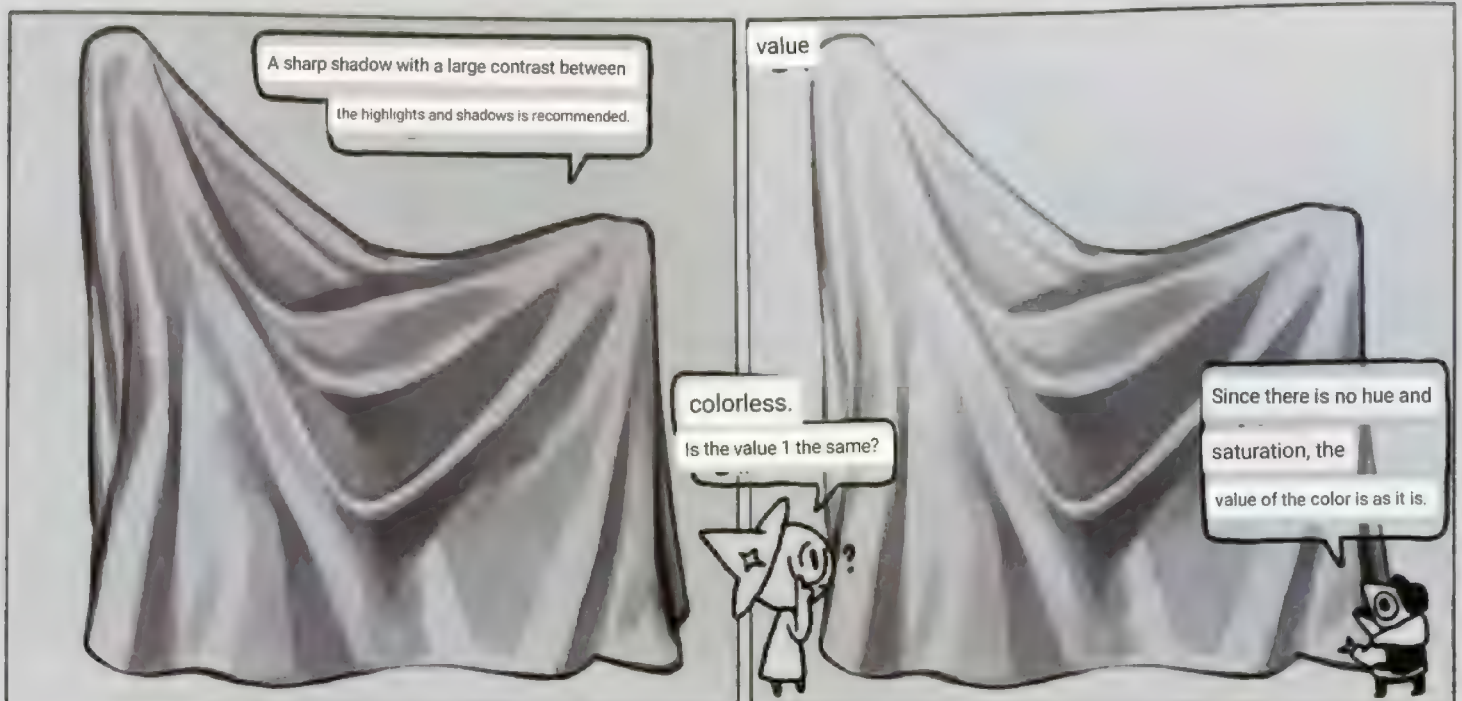
② Color the colored layer with color and saturation on the colored layer, paying attention to the value. After coloring, release the value check layer and check the three-dimensional effect created by the color value.

by value
It is similar to coloring the gradation...

Even if partially painted

Good~

(Because I paint with subjective colors It feels more colorful!

Color properties are determined by how the object interacts with it, and sometimes colorful can also be observed. However, since color is a subjective sense felt by the observer, color can be expressed more freely and subjectively when coloring while keeping the value. Let's find out how to express the objective color you create and the subjective color you want to paint together.

① Prepare a non-achromatic object and a layer to check the value, and partially color the colored layer with a color with the same value

The list should show the original color of the object!

THIN

Can I just paint it?

· The low saturation and dark colors have a relatively constant value, so paint over shadows or shadows as much as possible!

② Turn off the visibility of the value check layer and check the color.
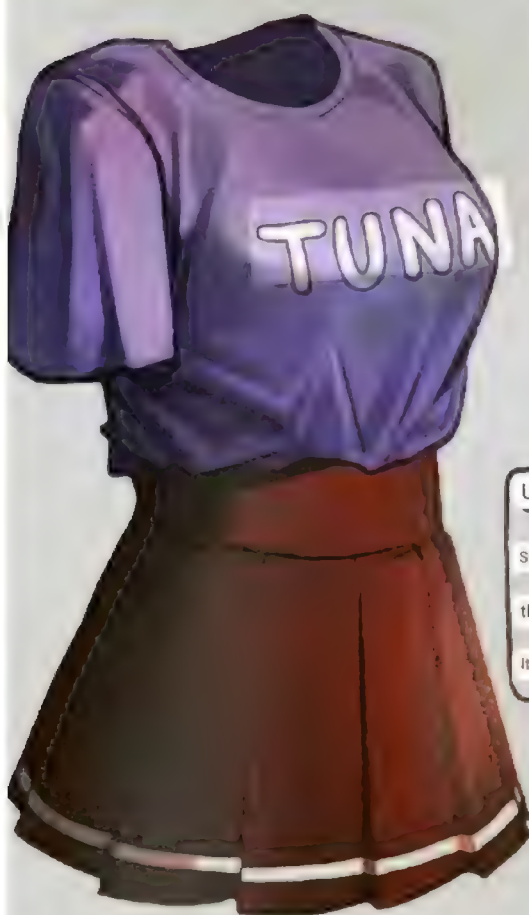
⚠ Even if the value of the overpainted color is the same, it is a color that has different properties, so colors that ignore the original color of the object are avoided. Since the highlights of objects that receive light often have vivid colors, it is recommended to paint over shadows with relatively low saturation

Use
ㄹ ㅐㄴ

Since it is a characteristic of color rather than light, too subjective coloring is
It interferes with the expression of realistic light.

be careful

HHEL...

tree

what color was it

PART 07

coloring

HERE ON
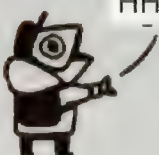
1_Coloring

▸ Coloring and coloring methods

(What pigment to shoot!

"How are you going to color it?

You can color them in different ways!)

The act of coloring a picture is called coloring, and it is divided into coloring methods according to the pigment or method of coloring. In the past,

based on traditional paintings such as oil paintings and watercolors, coloring methods were divided according to the painter's style. With the

advancement of technology, the coloring methods have also been diversified, and research has been carried out on various coloring methods from chemical pigments to digital painting

Make full use of the layer function or

LAYER

imitation of traditional coloring techniques, or

Color by compositing or...

go   min
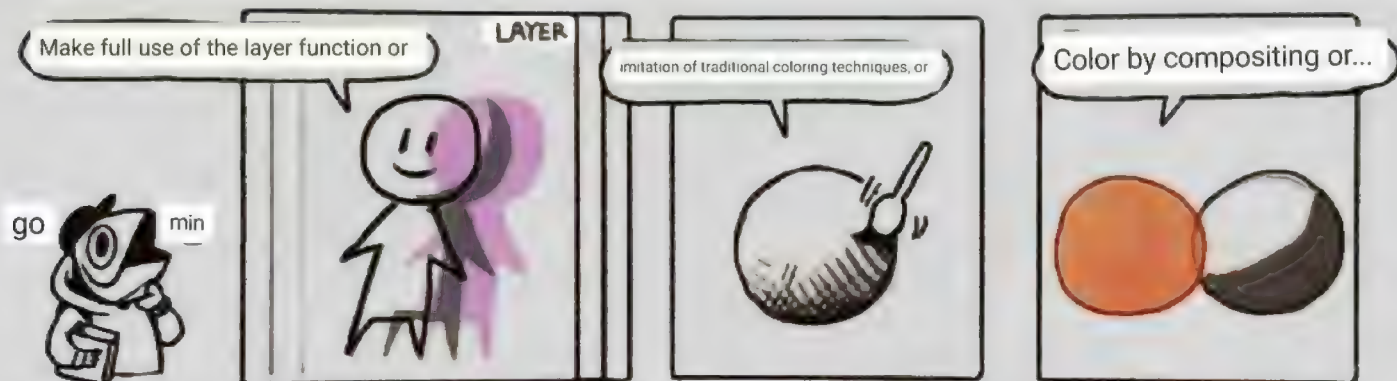
The coloring methods of modern digital painting, which do not have restrictions on the colors that can be mixed, are generally divided into several types depending on the coloring method. .

If you want to use a subjective color,

you have to color it

yourself and paint it yourself!

Realistic representation

comes first!|

Aww~

It's cute!!

I will do this too!

There is no right answer to coloring!!

Decide what to draw

- slowly decide

how to color it.

Depending on the object and purpose of coloring, or the taste of the creator, the appropriate coloring method may differ from situation to

situation. Let's learn and practice different coloring techniques, as characteristic coloring doesn't necessarily make a good picture

1. Representative coloring technique of painting

In order to use various colors efficiently, the technology for colored pigments has been steadily developing since the past. Various coloring pigments

determine the working characteristics of coloring, such as mixing properties and drying time, and the coloring method is also classified according to expiration

The coloring method according to expiration is often copied in digital painting, so let's look at the representative coloring techniques used in Haha

① transparent watercolor

Watercolor painting is a technique of coloring paper, etc. by soaking it with water-soluble pigments to make the colors darker. It is characterized

by intuitive brush strokes considering color transparency, and has been used for a long time without distinction between East and West

·The ratio of pigment to water determines the transparency of

the color ·Dry brushstrokes leave brush marks

가산혼합 →

Blendable but not intuitive
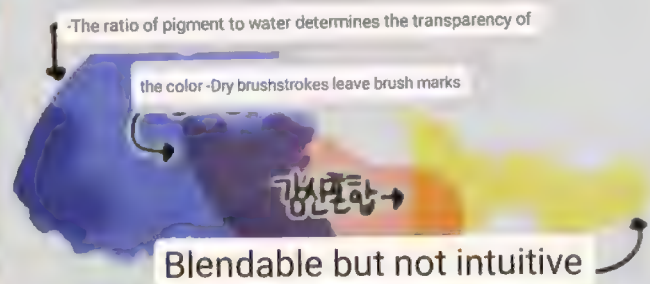
② Opaque acrylic, oil painting (Impasto)

Opaque coloring is a technique of coloring using pigments combined with oil or chemicals, and can paint thicker than watercolor. A thick layer

of pigment can completely hide the color of the canvas or background color, or it can be overlaid without mixing colors.

The color of the pigment appears clearly

Depending on the thickness of the paint, it can be colored without color mixing

Mix colors with brush strokes (blending)

3 Translucent - gouache

Gouache has a very high pigment to water ratio compared to watercolor, and is a pigment designed for use in opaque coloring methods

Opaque coloring is possible with a watercolor-like brushstroke, very similar to the function of a brush in digital painting.

Unlike watercolor, subtractive mixing does not appear.

Similar to digital painting
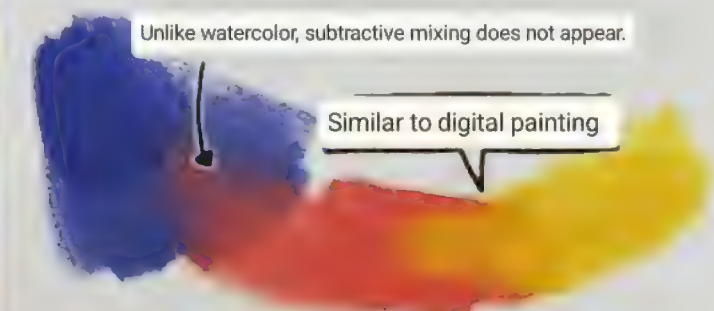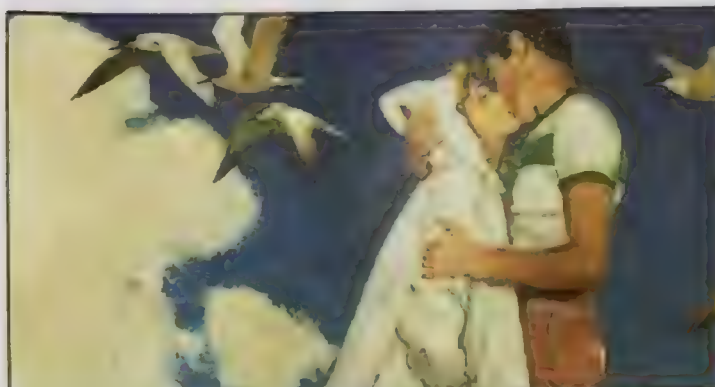
2. Representative coloring method of digital painting

①Cell coloring method

I can't go through all these drawings one by one!!!

→ Use separate linework

The shape of the shadow is clear

► Use simple and unified colors
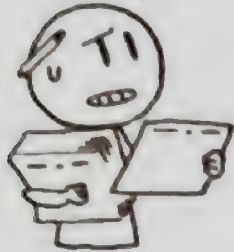
Instead of making the colors simple and vivid, make the delicate line art the charm of the picture!
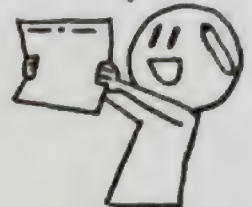
This is a coloring method that expresses contrast by filling only the cells with color, which is the basis for drawing animation. It has a characteristic that the color arrangement or shadow of the picture appears intuitively because it is described by distinguishing the color in a specific area. The role of layers is clear and you can take full advantage of the layer blending options, so linework and colors are well distinguished.

It takes time and detail until the line art is neatly completed..!!

V Most of my work is on line art...

Instead, the coloring is simple.

If it's clean it's ok!!

should be dark

Combining colors

appropriately with layer blending
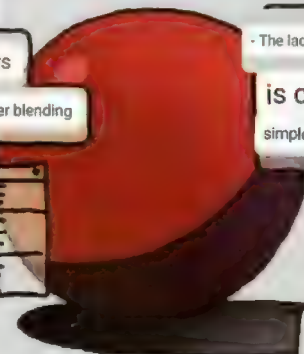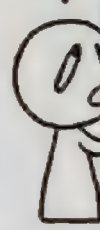
- The lack of description

is quick and simple with an airbrush!

By adjusting the color by combining layers, you can color more vivid colors, which is useful for bright and transparent coloring. In addition, the speed of coloring work is rather fast because the distinction between light and dark can be expressed intuitively

Generally, gradation is expressed at the border between light and dark
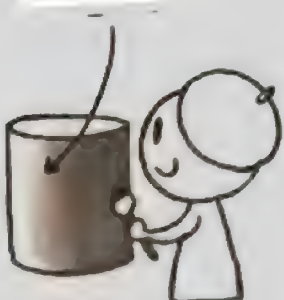
I can't describe the gradation in detail day by day due to work efficiency...

A pile

of things to do.
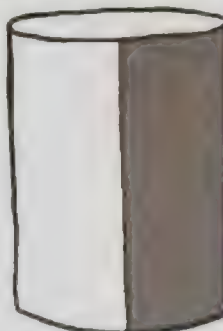
Instead, let's describe the line drawings and colors neatly!!

The cell-type coloring method is suitable for cartoon expression because it is not possible to describe the color gradation with brush strokes, so there is a limit to depicting a three-dimensional effect

► Learn about layer blending options

Cellular coloring, which utilizes many layers, can take full advantage of the compositing capabilities of digital painting programs

Let's take a look at some of the features that help with coloring.

Normal

This is the default setting to color over the layer's opacity.

Multiply

Composite dark. It is often used when painting shadows.

3 Linear Bum

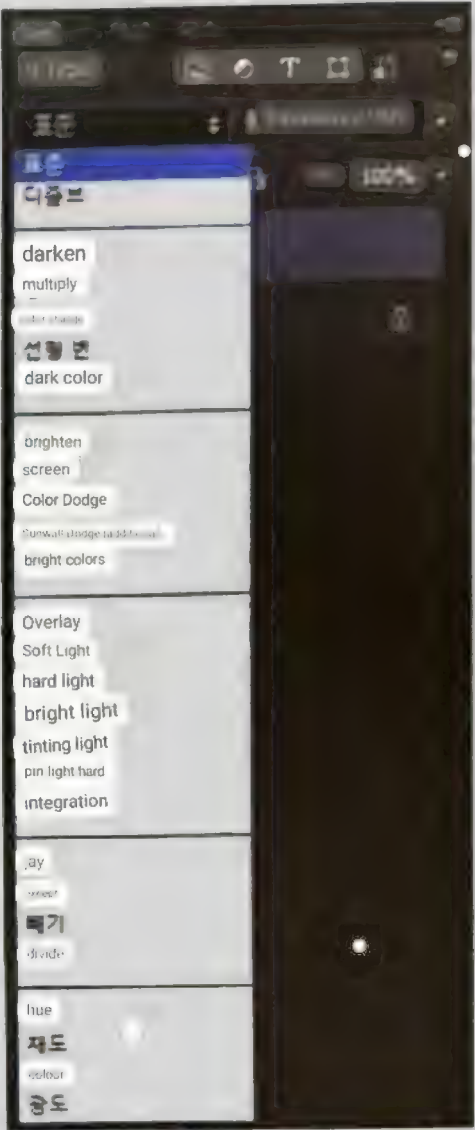Subtractive mix. Since it is unconditionally dark, it is mainly used for line art.

4 Screen

Composite brightly. It is mainly used for lists.

5 Color / Linear Dodge Additive blending.

It is mainly used for specular.

5 Overlay / Soft Light

It is halfway between multiplication and screen, and depending on the color, it can be darkened or

lightened. It increases the saturation and is often used to correct the overall color.

darken
multiply
선명 번
dark color

brighten
screen
Color Dodge
bright colors

Overlay
Soft Light
hard light
bright light
tinting light
pin light hard
integration

ay
screen
특기
divide

hue
채도
colour
명도

List, specular uses

④ screen (color of
light source)

the overall color.

⑥ Use of overlays

-Use the shadow by multiplying it by ② (color of ambient light)

For line drawing, use ③ line number

in other coloring methods

for efficient work

as it is used very often

Learn the basics

Order of cell coloring method

1. Draw a clean line art on top of the sketch. It is a very time-consuming task as it has to be drawn without any special instructions

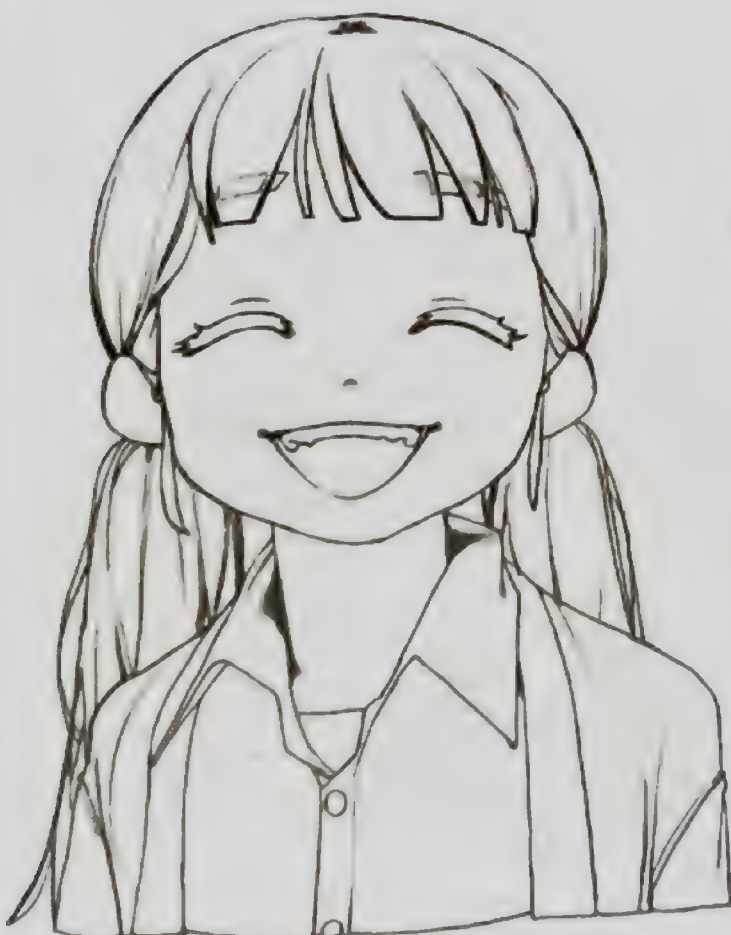I finished most of the depiction in the sketch.

With the feeling of leaving only the necessary lines"

Keep it as clean as possible

No special skills required!

2. Arrange the line art.

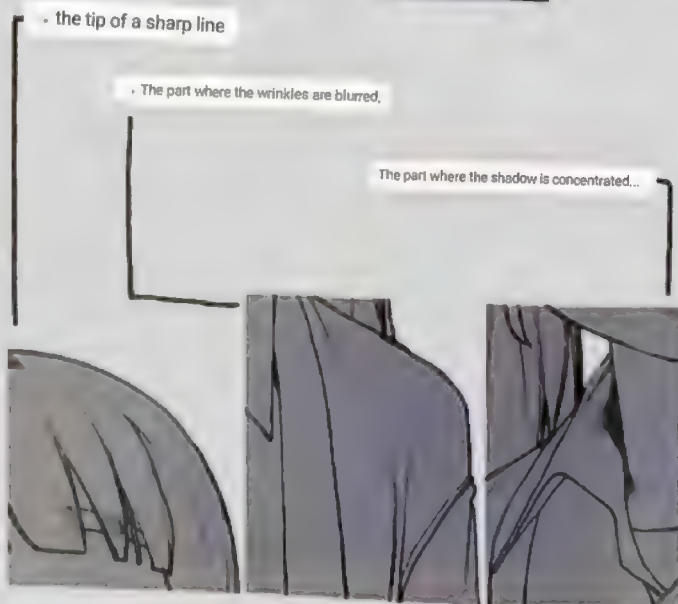Erase unnecessary lines, or naturally blur the ends of the lines

It is convenient to use two fingers.

· the tip of a sharp line

· The part where the wrinkles are blurred,

The part where the shadow is concentrated...

It is important to see the direction of the light!!

Lock the transparency of the base color

between layers
Alt + click

It is clipped to the layer below.

color does not come out

-Clapping/

I paint the colors neatly and color them with a clipping mask.

4. Apply shadows according to the light direction by multiplication composition

·The shape of the contrast boundary is important.

-Erase it too.

Ctrl+U to adjust

with a soft airbrush.
Color it or...

Use the finger tool if necessary!

You can even remove the color with an eraser.

Refine the shape around the border of the shadow.

6. Adjust the color by calibrating the shadow layer.

7. Create a new shadow layer

Overlay the insufficient contrast.

Adjust it in the same way as a traditional shadow layer to reveal a color that suits your taste.
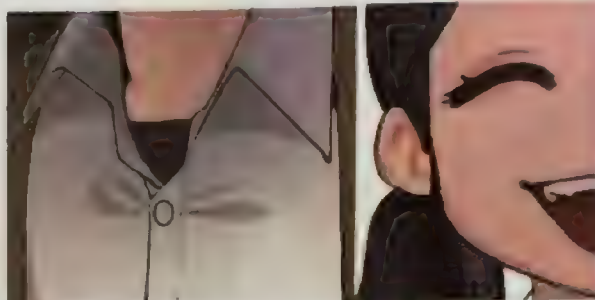
I paint over the areas where the shadows gather and the shadows of small folds to give the impression of drawing a shape.

A rather vivid pink color is softly synthesized for a lively skin color expression.

8. Black line art is unnatural

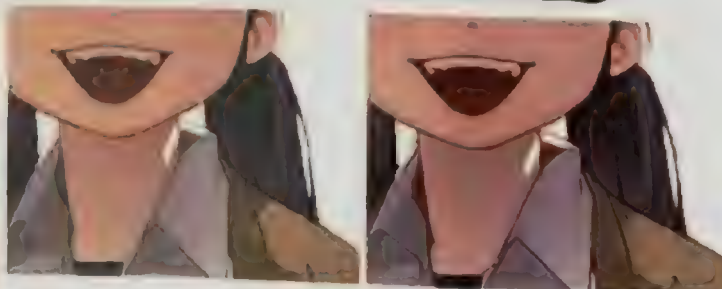Replaces the color of the line art in whole or in part. Linear burn synthesis can be used.

By lowering the transparency of the line art, [Transparent watercolor feeling

Even if the outline is dark, it looks natural!

To make the color stand out by synthesizing it with vivid colors

The reflected light and specular are painted according to the material

of the object. It is recommended to color the

, soft expression first, and then paint the high-definition specular

last. You can utilize cystic/linear dodge compositing

Even the soft reflected

light is clear as if drawing a shape....

Erase the tip slightly,

Emphasizing boundaries

is effective.
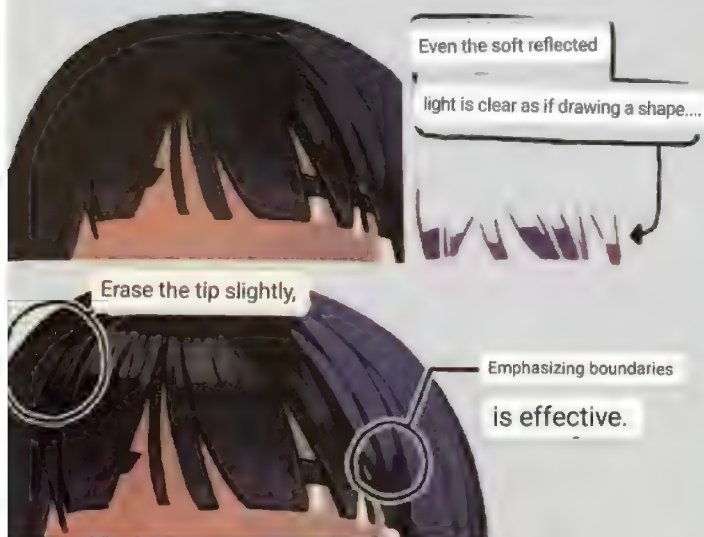
0. Finish by coloring the parts that could not be described

with line drawings or small differences in light and

shade. In the final stage, it is recommended to paint in detail

like drawing with a pencil rather than using the compositing function

thank you for your effort!

After the line

drawing, the coloring is simple...
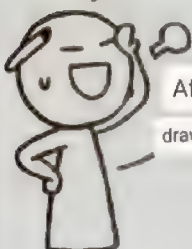
2. Watercolor painting method

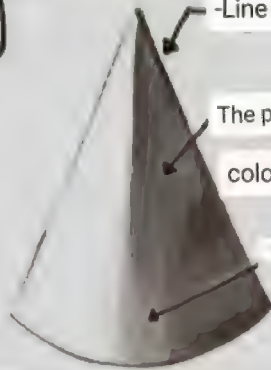Digital is just a difference in tools, you have to paint the colors yourself!
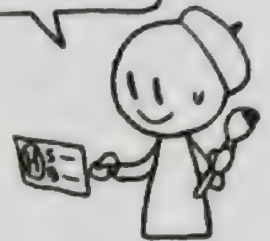
-Line drawings only serve as sketches...

The process of mixing colors is called blending.

The more detailed the expression, the more writing skills are required

It is quite difficult to color directly, but it is possible to express it in detail!

This technique uses the brush tool of a digital painting program like a brush to paint over colors directly. The brush tool is a blending method that adds opacity, so it can be used similarly to translucent coloring techniques such as gouache. Although the handwriting of the creator is required as much as direct painting with color, it is the basis of digital painting because of the great potential of depiction

Line art is an extension of the sketch, and the more detailed it is, the easier it is to describe.

Let's just do what we need
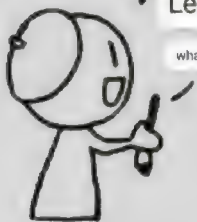
- the outlines are clearly visible

Let's change the sketching method for smooth gradation!

Expressing the strength and weakness of lines in necessary areas

Blending as planned is the beginning and end of the description!

The more you refine your brush strokes, the more detailed you can express, and the more freely you can use colors, the better your sense of color writing is. In addition, if necessary, you can color using the various compositing functions of the digital program

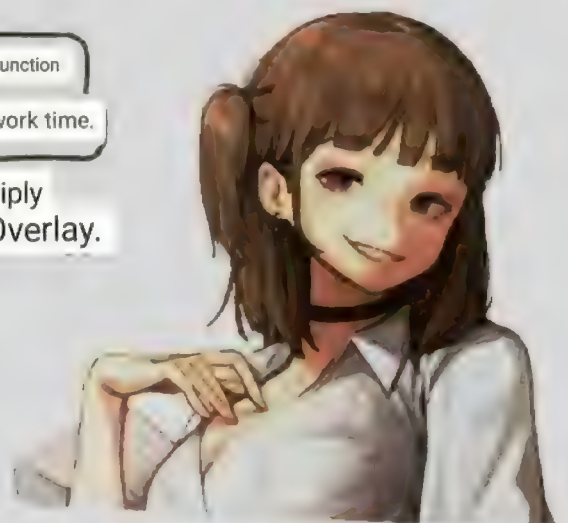'Filling' and 'coloring' are the easiest~

Haha... it's so hard...!!

Whenever I draw...

Use the compositing function to shorten your work time.

Multiply or Overlay.

Because it utilizes the settings of the brush rather than the layer, the creator's handwriting and the settings of the brush greatly affect the overall work. Compared to other coloring methods, it takes a long time to describe and it is difficult to correct, so it takes a long time to work

► Setting the brush

Using the brush tool in Photoshop, etc., you can color in various ways.

Let's see how to set up and use the brush's features. The default shortcut is FS.

① Brush Presets

Load the brush with saved settings.

Right-click on the canvas in brush mode to open it.

2 times shape. ③ Brush size, ④ Hardness can be easily adjusted.

5 Shape dynamics

Sets the element that controls the size of the brush. Set the

pen pressure of the tablet pen as the default, and

adjust the minimum diameter according to your preference

Adjust size

with pen

pressure (minimum diameter ○ x)

Uniform national stroke

(minimum diameter 60%)
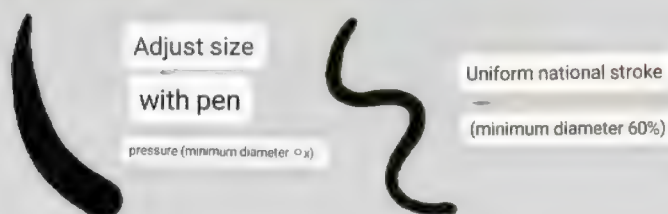
6 Transfer

Set the element that controls the transparency of the brush.

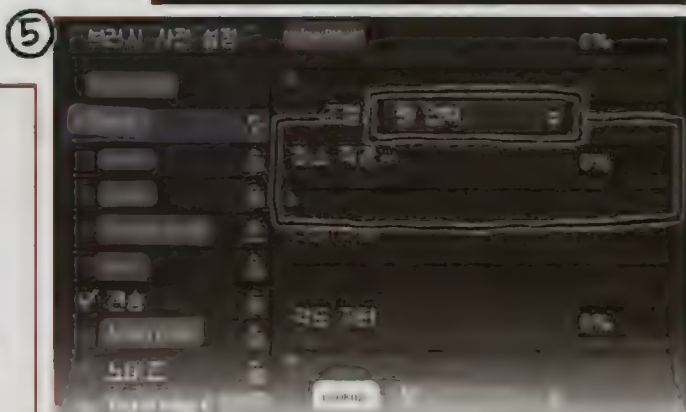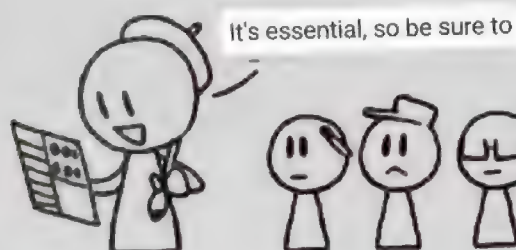If the minimum opacity is low, it is easy to paint like watercolor,

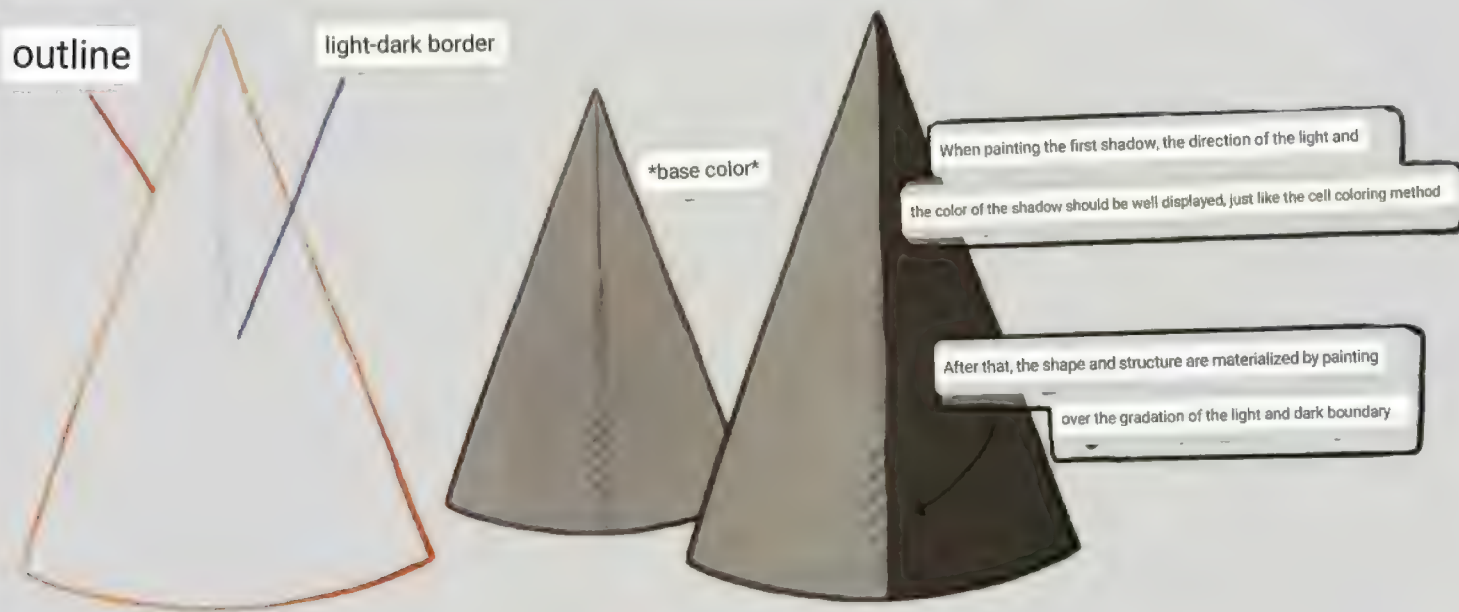and if it is high, it can be painted without mixing like oil or acrylic.

· Minimum opacity

0 f,

· Minimum opacity

70%

7 Create a new brush

Saves the current brush settings as new.

Saved brushes can be loaded from brush presets.
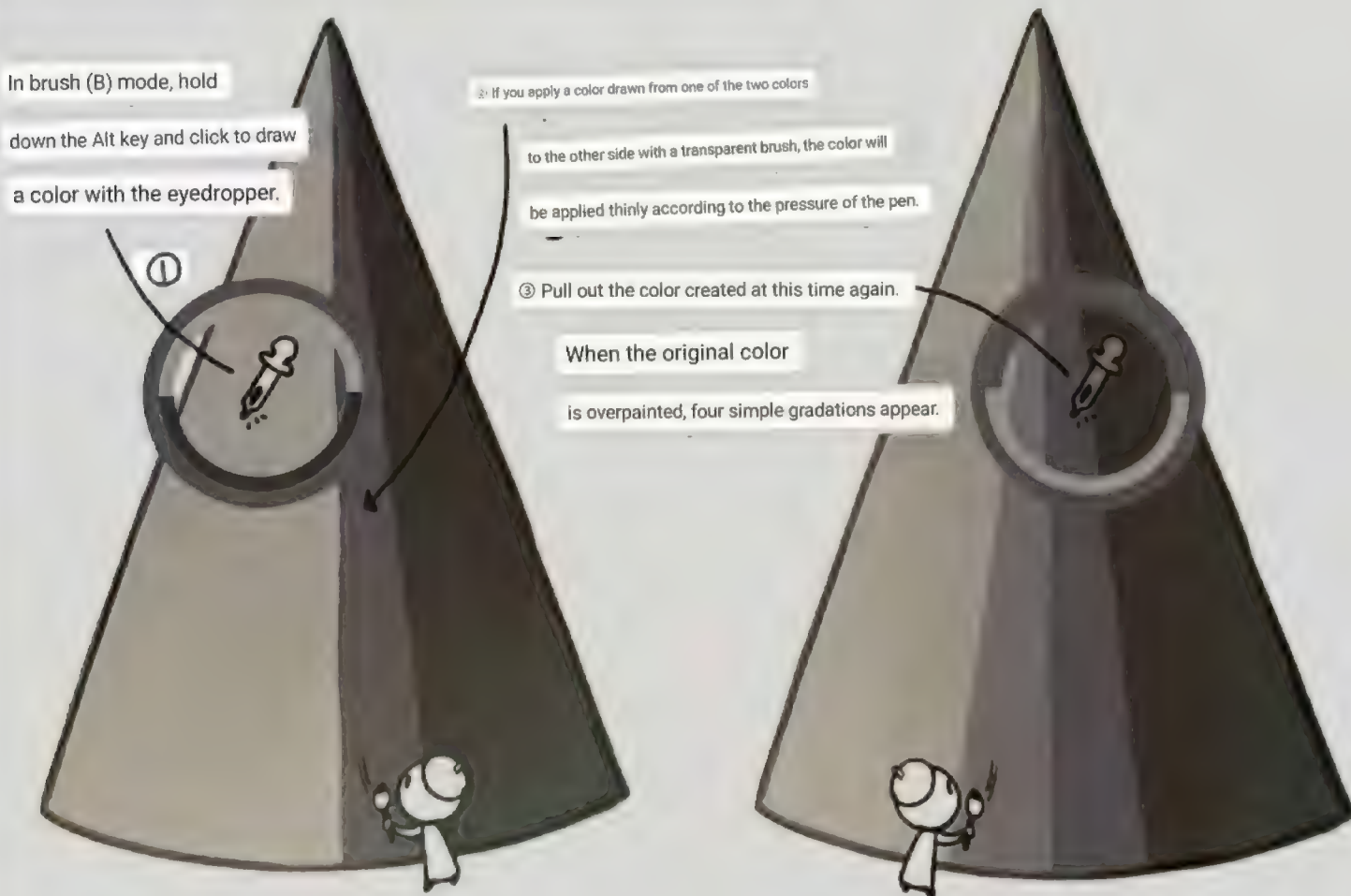
It's essential, so be sure to

practice blending

It is not an exaggeration to say that blending is everything in the watercolor method of coloring using a

brush. Blending is required anywhere colors are mixed, from the borders of shadows to gradations of color and saturation

outline

light-dark border

base color

When painting the first shadow, the direction of the light and

the color of the shadow should be well displayed, just like the cell coloring method

After that, the shape and structure are materialized by painting

over the gradation of the light and dark boundary

Paint the shadow area with an opaque brush to show the light direction. When

organizing the sketch, it is convenient to sketch the contrast line along with the outline.

In brush (B) mode, hold

down the Alt key and click to draw

a color with the eyedropper.

①

② If you apply a color drawn from one of the two colors

to the other side with a transparent brush, the color will

be applied thinly according to the pressure of the pen.

③ Pull out the color created at this time again.

When the original color

is overpainted, four simple gradations appear.

- The more you repeat the same

method, the richer and softer the gradation becomes

Adjusts the gradation according to the kurtosis of the

corners and refines the shape and structure

simple!!
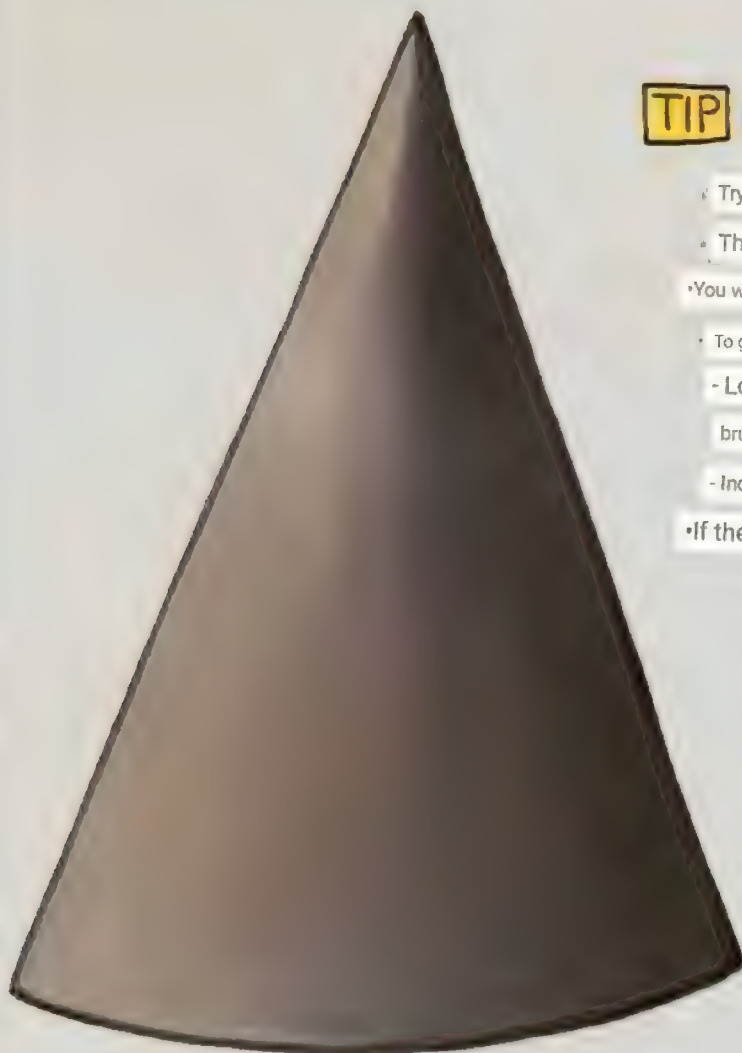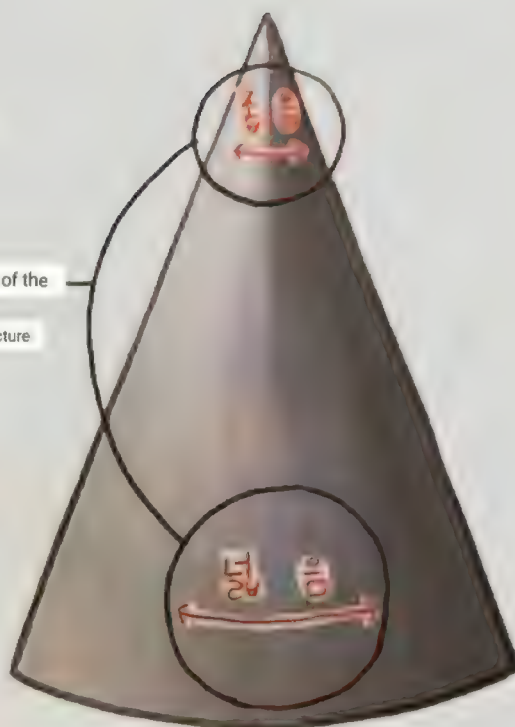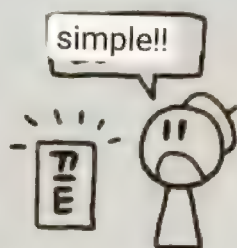
TIP These are my personal tips.

Try using the brushes in the order of large, soft-small and sharp ones.

The finger frame is optimized for blending.

You will press the Alt key very often than you think..

To get rid of over-touch marks...

- Lower the opacity of the

brush. - Decrease the hardness of the brush

- Increase the size of the brush.

If the brush is very small, you can also blend outlines.

for efficient coloring.

Find your own blending tips!

The order of watercolor painting

Most of the drawings in this book were painted in watercolor.

If you feel like 'selling'

a new sketch for line art using the cell-based method...

The watercolor painting of the line

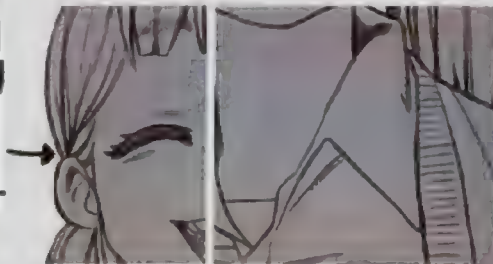art gives the feeling of 'refining' the sketch in detail!

It is not a coloring method that makes the line art stand out,

but the more detailed the line drawing, the more convenient it is to

1. Arrange the line art on the sketch and draw it. You can express the strength and weakness of lines by adjusting the opacity of the brush.

closed shadow

Let's plan the darkening part

or the division of the light

and dark boundary!

Please, the future me! number

2. It is useful to sketch the areas where the shadows gather or the areas

where the contrast is clear with a soft line.

3. After that, in the order of the cell-based coloring

method, even the shape of the shadow is painted

[For efficient coloring!

Multiply the dark places...

To make blending easier,
I slightly erased 1 shadow...

]Let's fine-tune the color
of the shadows for rich gradation!

If the cell coloring
method is to fill
the shape of the shadow...

The watercolor painting
method is to specify the
color of the shadows!

4. Refine the color of the contrast boundary and shadow. Brush and eraser, two burners   This is useful.

*The more detailed the color of the shadow is designed in the early stages of coloring,

the more efficient the work becomes as the subsequent coloring stage can only focus on the blending of form and structure

shadow color adjustment   blending   Material representation

5. If you change the color of the line art and combine the line art.

It appears in a darker color than the base color

Blending the colors that appear at this time will give you a richer description

object color

shadow color...

For skin, red is recommended:

[Blending]

Blend the large

and gentle structure first with a large brush,

Blending details
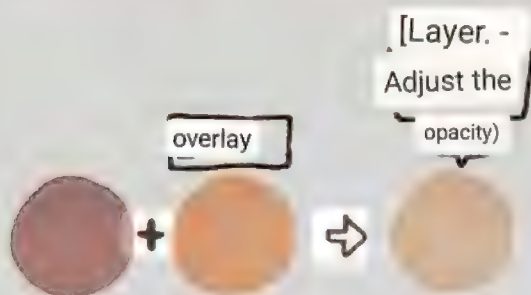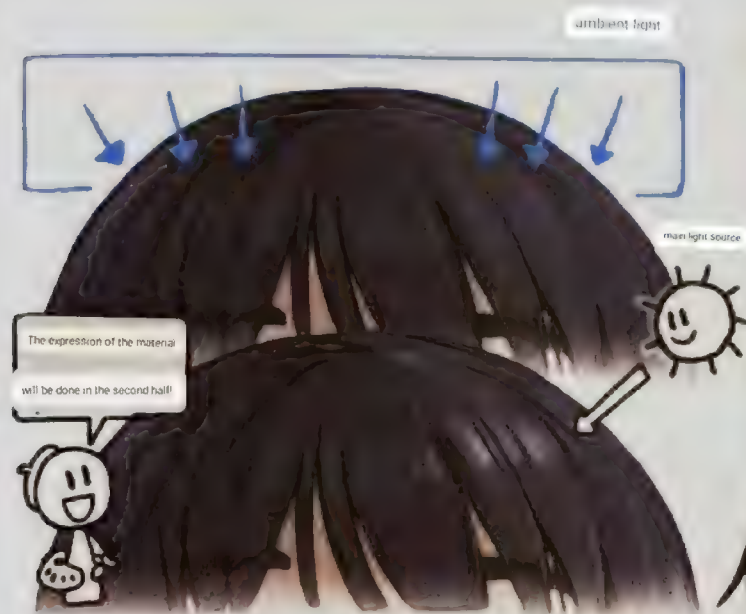
and outlines with a small brush!

6. After that, color and color are blended to express the three-dimensional effect in detail. Large brush (large curve) . Small brush (fine curve) is recommended

7. Color with a large, soft brush from the specular of wide and

weak light (ex, sky, ambient

As the brush gradually becomes smaller and more opaque

light). Colors bright and vivid speculars.

ambient light

main light source

The expression of the material

will be done in the second half!

[Layer. -

Adjust the

opacity)

overlay

8. In the watercolor painting method, the saturation decreases as the colors

are blended, so increase the saturation using

overlay composition. Afterwards, with a very small brush, I add

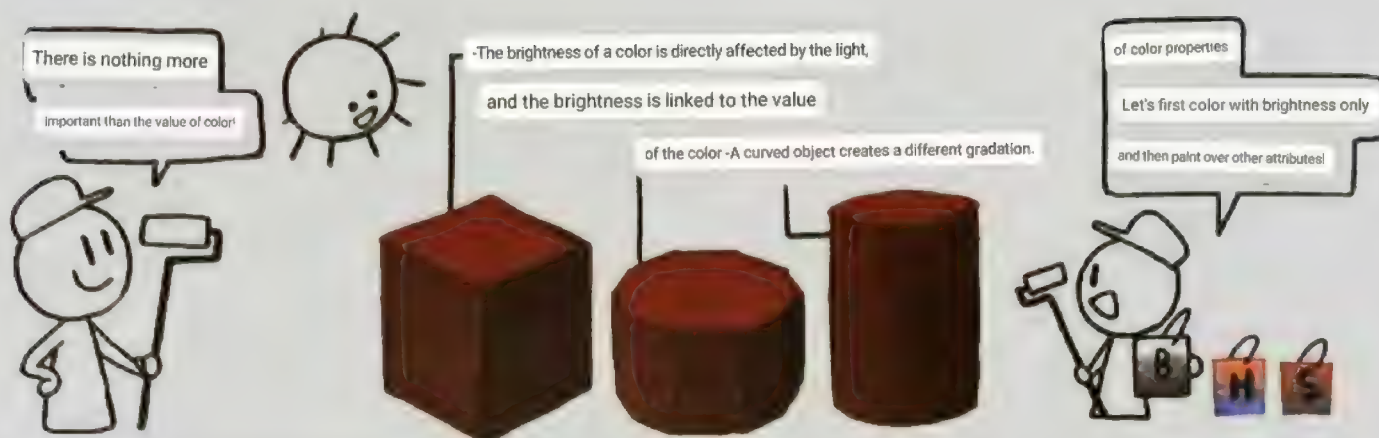detail and clean up the depiction and finish it off.

thank you for your effort!

Regardless, brush

strokes are the most important...

③ Glazing Coloring Method

There is nothing more important than the value of color!

·The brightness of a color is directly affected by the light, and the brightness is linked to the value of the color ·A curved object creates a different gradation.

of color properties

Let's first color with brightness only and then paint over other attributes!

The glazing coloring method is a technique in which the highlights and shadows displayed by light are colored only with the gradation of the brightness, and then the color is added later. The three-dimensional effect can be expressed dramatically because it intensively depicts the value of highlights and shadows, that is, the lightness and darkness of colors. Because the shape and brightness of the shadows are given priority, the line art does not appear well, and for this reason, it is mainly used for realistic depictions

I'm going to paint the shadows with 'cotton'.

|Slightly only the outlines and contrasting borders!

Contrast

LK boundary

Paint the gradation of lightness with cotton,

Blending!!

And color it!

By focusing on the shape of the shadow rather than the line, the three-dimensional effect is maximized, and the more you practice, the stronger the form becomes. In general, the work is faster because the line art is omitted and only the brightness of the color is adjusted. 1)

Form Power: The ability to recognize and express a three-dimensional shape in an object

What if the color doesn't go well? Value is good but...

paint it!

I need to paint the shadows as 'area'![

outline and

Why do you have to make it difficult?

Colors cannot be colored intuitively because they are mixed and painted over an achromatic picture. It may be difficult for beginners to describe a three-dimensional effect only with the brightness and shape of the shadow without relying on the line drawing

In digital painting programs such as FT Shop, you can use the layer compositing function to paint over colors in various ways.

Actively use layer compositing!
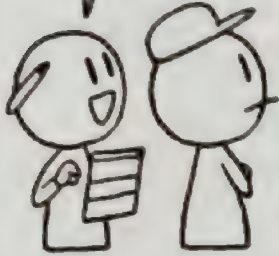
gray object + overlay

▶ **Volume first**

First describe the sense of volume with an achromatic object, then

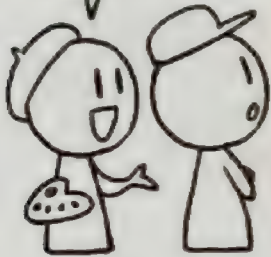This is a method of adding colors with overlay composition.

Since all of the hue, saturation, and lightness of a color are

You can color it intuitively.

synthesized, it is necessary to describe additionally after painting

Traditional technique used in oil painting!

Value coloring + color

▶ **Value first**

Coloring with black and white images considering the value of color.

It is a method of coloring by adding color and saturation.

-Because the value of color is prioritized

Vivid colors appear.

- It is difficult to color because it cannot

be applied intuitively.

Although the method of coloring is different, the order of coloring the gradations of brightness is similar, so you can proceed according to your preference when adding colors

Glazing technique of TMI oil painting

Originally, glazing is a method of painting with light and dark gradations of the paint color and coloring with red paint by increasing the amount of oil while the paint is

dry. Because of the large amount of oil, the paint does not cover the base color and is transparently accumulated, and the base color and the over-painted

color are densely overlapped. Most of the paintings in Western art history that we are familiar with used

the glazing technique. Conversely, the technique of applying paint thickly is called the impasto technique

Let's keep the brightness by adding a thin layer of paint!

[Let's paint thickly!
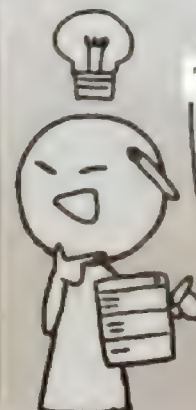
'If I do this well, I think it will be possible with layer compositing?!'

GLAZING

DOUGH

Common sequence of glazing coloring method

This is the process of coloring the shadows before adding color

1. Sketch outlines, shadows, and contrast lines together. It is better to proceed as sketching the contrast as an area rather than a line.
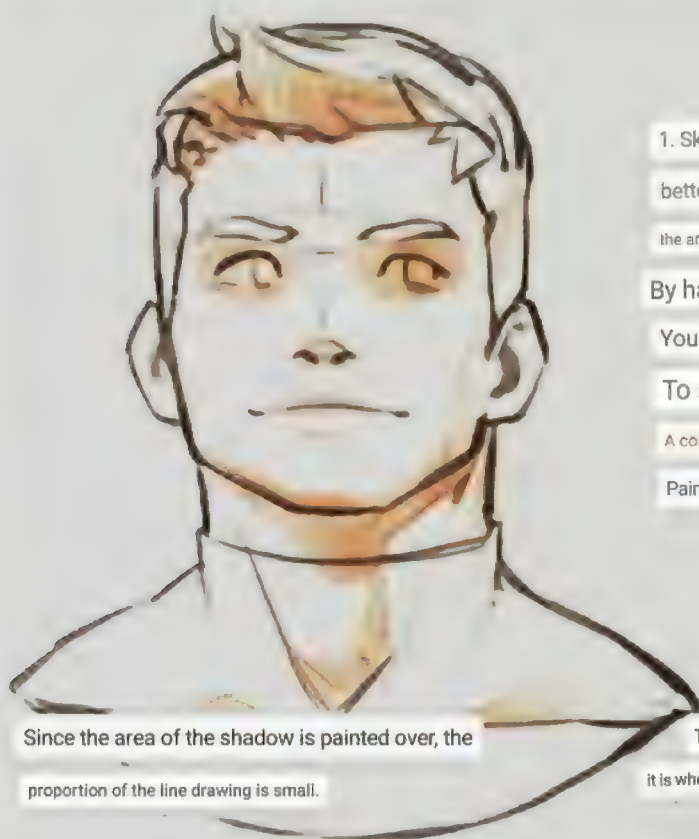
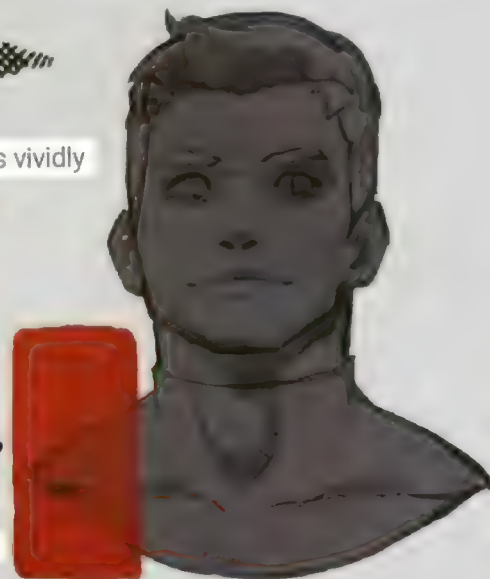the area of the shadow

By hatching

You can sketch. 2.

To synthesize colors vividly

A color with 50% brightness

Paint the base color.

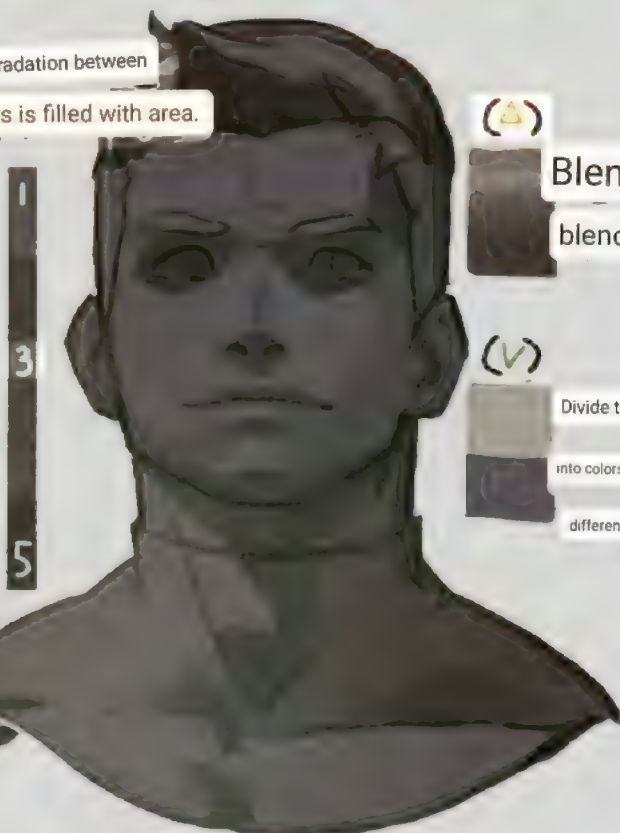Since the area of the shadow is painted over, the proportion of the line drawing is small.

The color appears as it is when compositing the overlay.

Paint the shadow with a color with a clear difference in brightness

The gradation between colors is filled with area.

Blending

blends colors.

Divide the gradation into colors with distinct differences in brightness

3. Sharpen the shadows with the lowest brightness.

4. Describing light and dark levels with grays of light intensity between the two colors. It is better to color with a clear border rather than blending

5. Describe the three-dimensional
structure by further dividing the gradation

| 1 | 3 | 5 |

middle shadow   add it

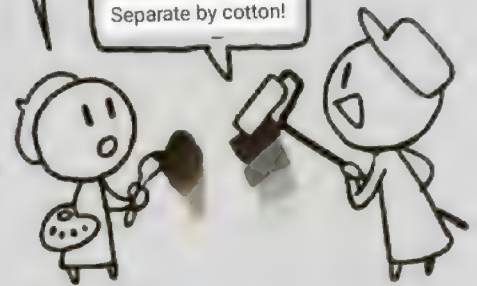| 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3.5 | 3 | 3.5 | 4 | 5 |

pick the color of the shadow

Gradually paint wider
towards the lighter side.

Is it different from blending?

difference in name

Separate by cotton!

Continue to fill the area with medium-light shadows.

6. While reducing the size of the brush

It also depicts the shadows of detailed bends

From the process of making the shadows

more detailed, I color the borders

with the feeling of removing the line art.

Depicting the small bends inside the shadows...

Divide the contrast

boundary by the difference in the brightness of the shadow

Spread!
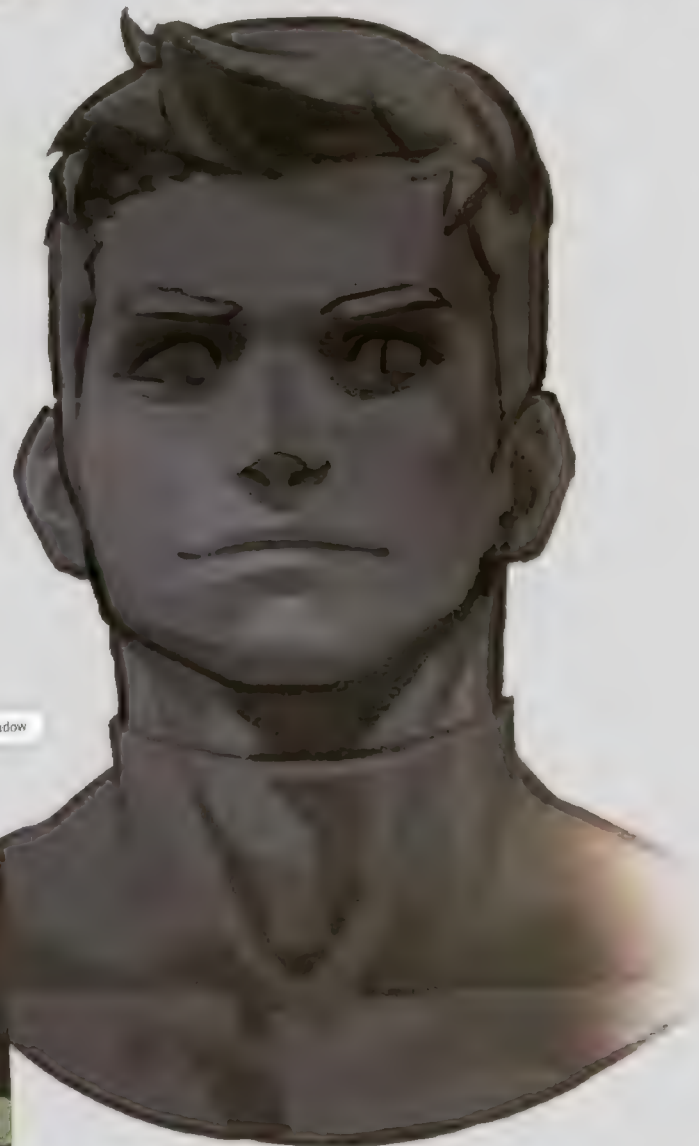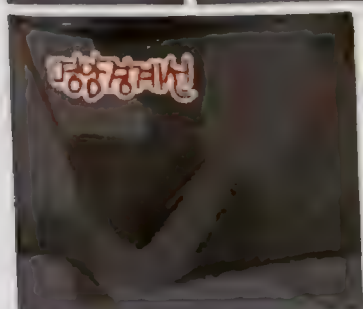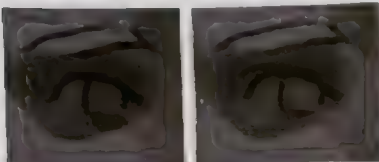
practice with a mockup

It is difficult to intuitively observe the difference in the brightness of

the shadows because the round-shaped object has a soft gradation.

Let's practice using Photoshop's filter function to correct an image and color it with an area.

Even if it's a bit awkward,

try painting on one side

Separate colors by adjusting the number of levels.
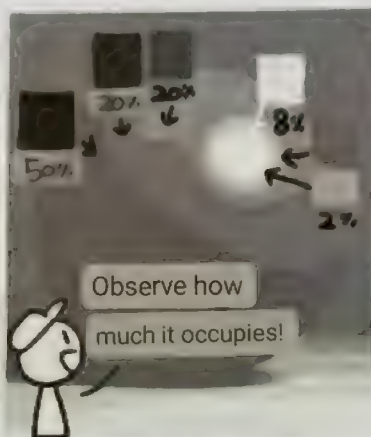
Observe how

much it occupies!

1. Correct with Filter - Artistic Effect - Crop.

2. Observe the ratio of gradation and describe it as an area.

Describe even

small curves

6. The smaller the brush, the

It depicts three-dimensionality

It also expresses small differences in color brightness

as much as possible with small structures

Don't miss the small difference

in brightness!

Leave the

sharp curves intact.

7. Blend the colors with priority on

the smooth surface.

Round curves

are blended.

This process is

the same as the
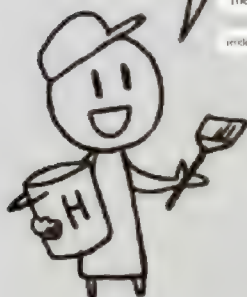
watercolor painting method.

fine hair,

8. Finish the depiction by

adding detailed structure

with a transparent brush.

- eyebrows.

Up to this point, the basic drawing method is the

same, but the coloring method is

different from the process of adding color.

The three-dimensional

rendering proceeds as much as possible here.

- A little bit of thickness...

volume first

overlay

1. Using the clipping mask function, add the

color you want to

paint over as an overlay composition

In gray at 50% brightness

The over-painted colors are clearly visible.
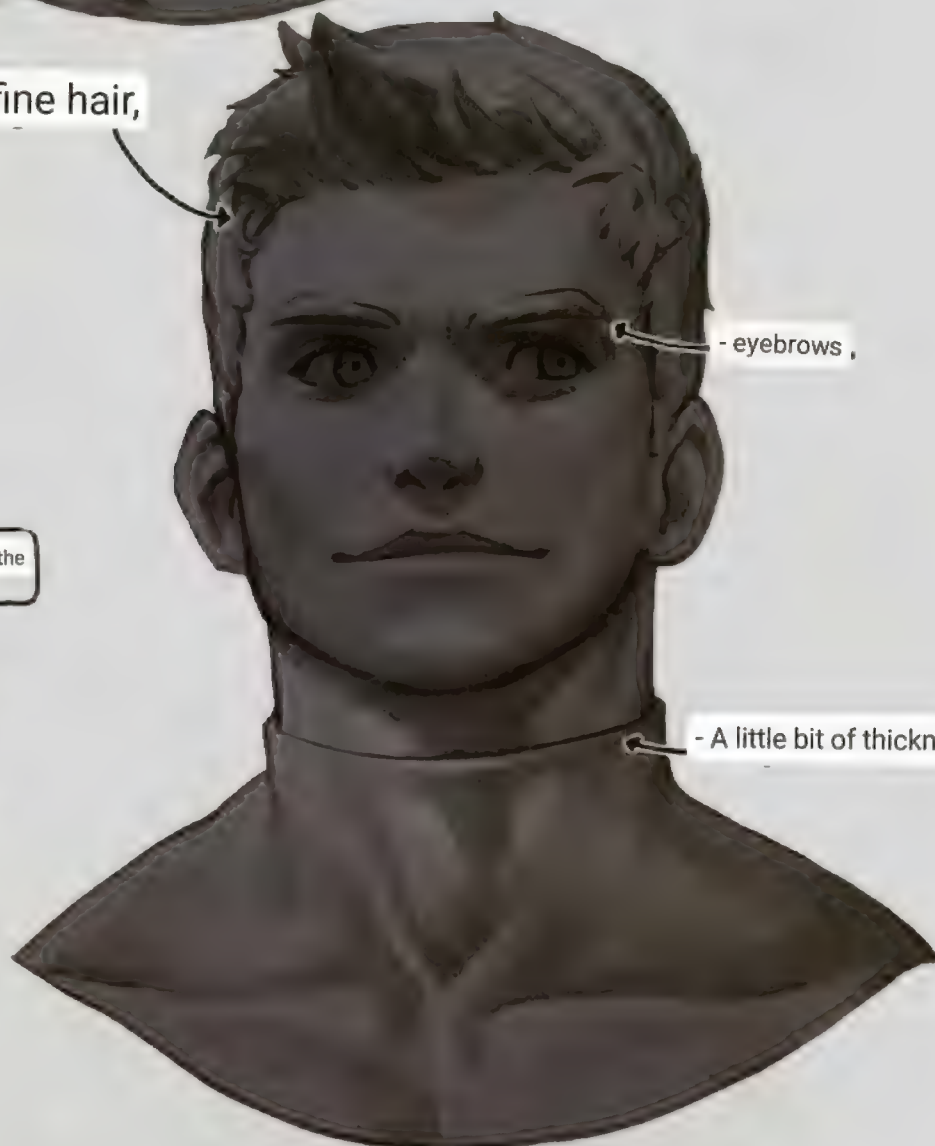
When compositing an overlay,

the over-painted

color is synthesized as it is.
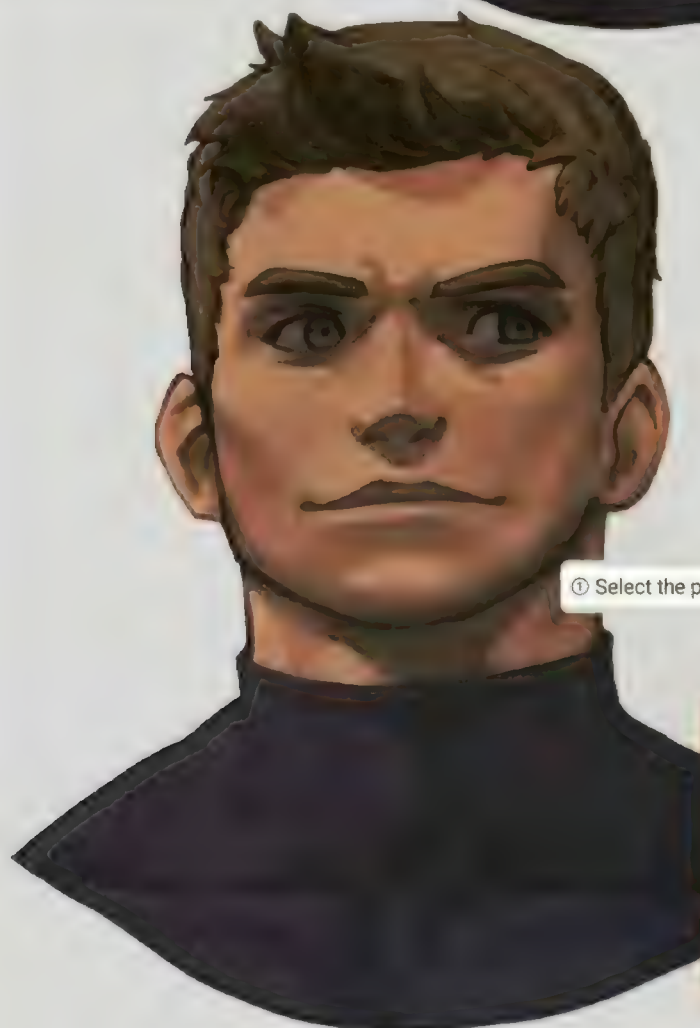
2. To correct the color to be overpainted

Select → Select an area by color range   C#+U

and adjust Hue/Saturation.

② Adjust the allowable amount.

① Select the part to adjust the color
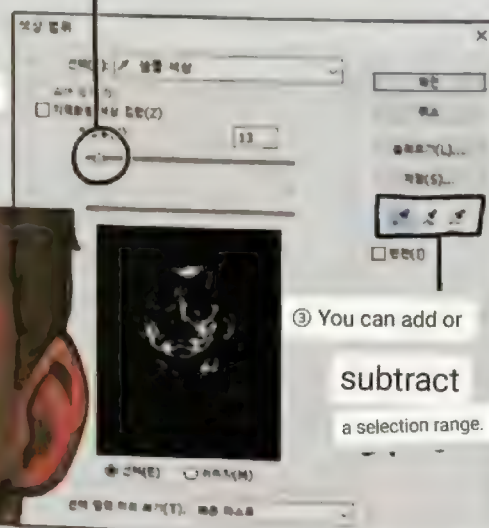
③ You can add or

subtract

a selection range.

If the lack of color

is overlaid with

overlay composition...

Airbrush

To paint the

correct color!

Specular according

to the material

is watercolor

3. Correct the lack of color with overlay composition, and the specular color is directly overlaid with a watercolor method.

CtH+G

4. When you are finished painting, group the layers or

Merge the masked layers and finish by

adjusting the color using Ctrl+E Curve Correction.

CtH+M

thank you for your effort!

'One three-dimensional

feeling is certain!

value first

dark color.

very
dark

Specular is
also a value~

1. Adjust the brightness of the gray based on the brightness, that is, the value of the color you want to paint. Lasso the area and use curve correction. 2

Color the specular shape and brightness while matching the values. Adjusts the brightness by considering only the illuminance of the incident light.

3. Clipping mask the new layer

Change the layer blending option to Color.

Adjust only the Hue and Saturation.

Describe while adding color.

this color

You can't

paint intuitively.

- What color (hue)

, Decide how much to fill (Saturation).

-Achromatic colors (white, black)

become less saturated

Brightness is 100%

keep it fixed

Lower the saturation here...

S ━━ ▮

S ━━ ▮

Here, let's make the skin color clear!!

(H) ↻

It ___ should be painted red!

4. Since the brightness (value) of the color has been set in advance, adjust the color and draft of the color to be applied and partially overpaint it so that various colors appear richly.

It's a bit difficult to color, but the value doesn't shift, so you can freely adjust the color.
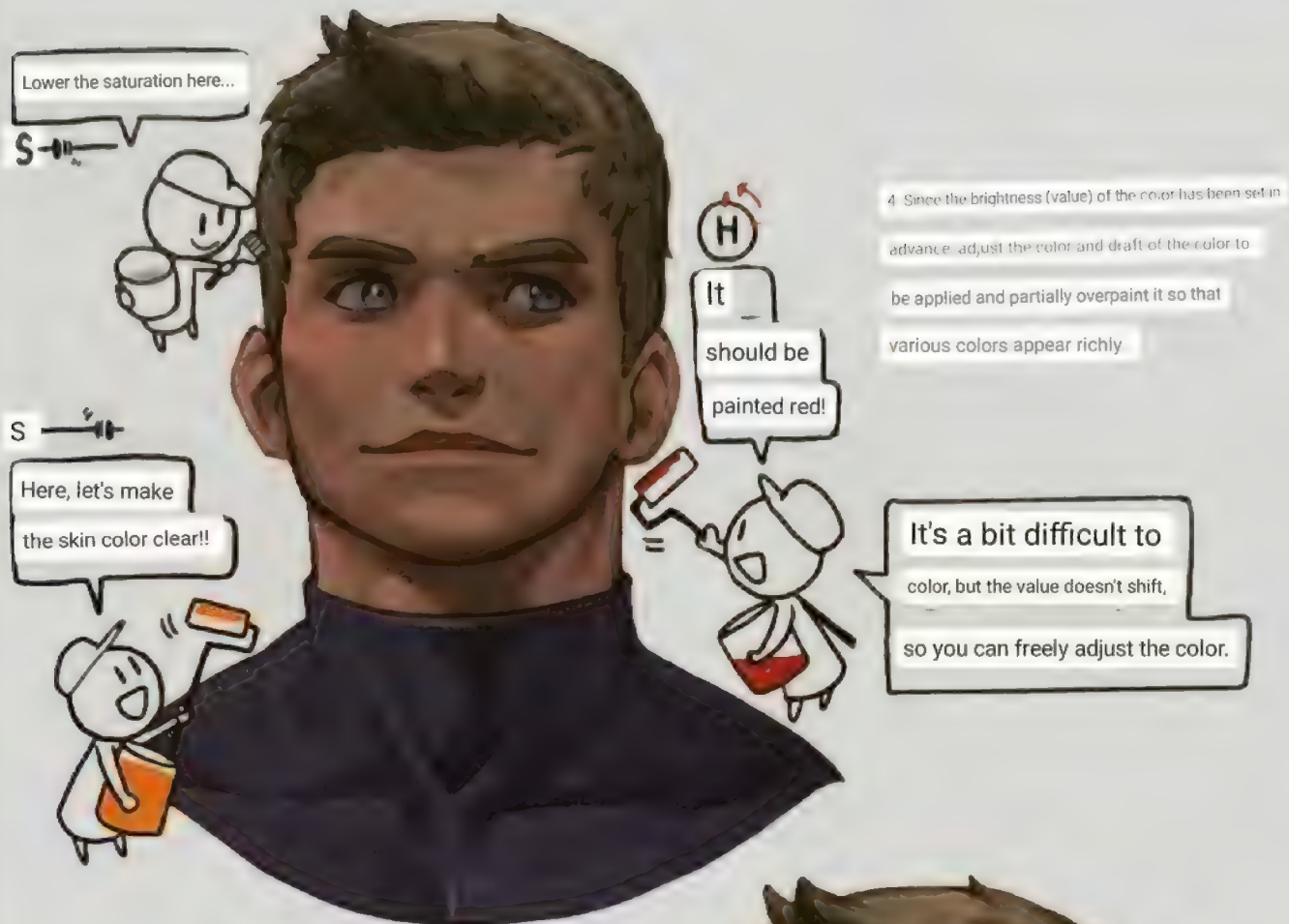
5. Adjust the color value on the gray layer. Similarly, when the overcoating is finished, group or merge the layers and adjust the color using curve correction to finish.

thank you for your effort!

As for the value, it is intuitive!

④ Render

We design light and color accurately!
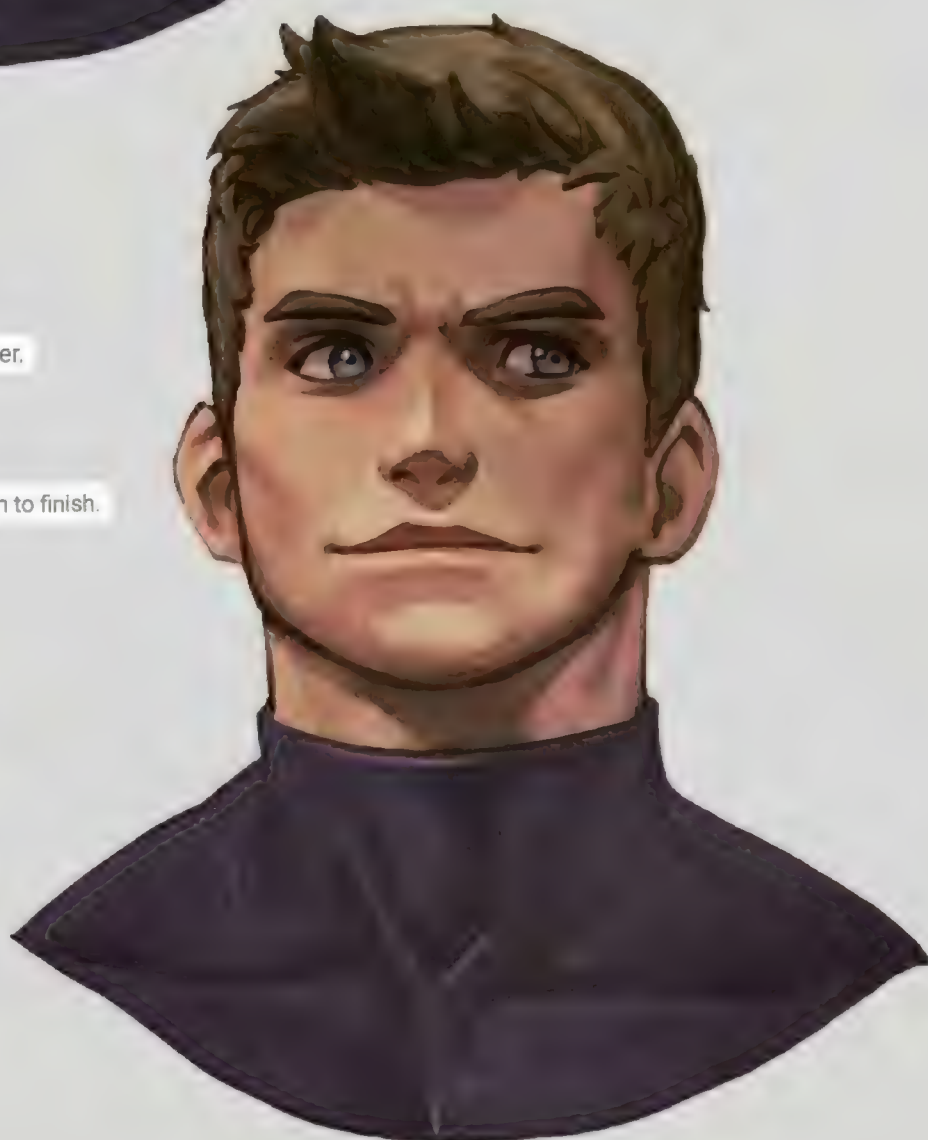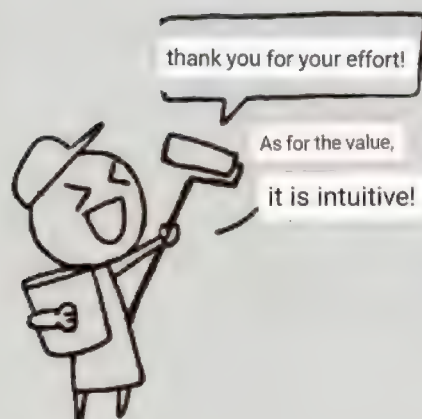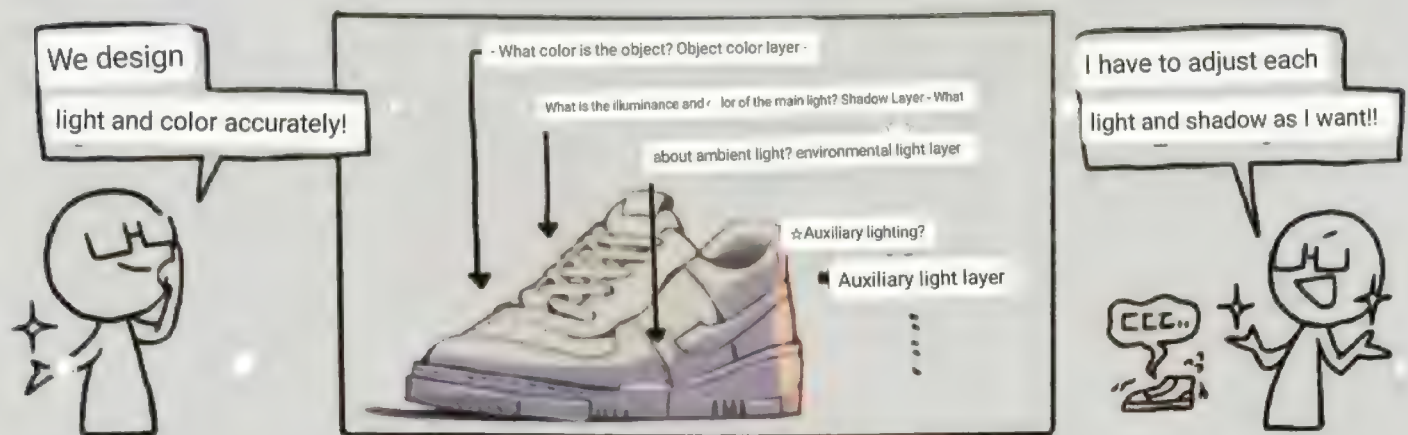
- What color is the object? Object color layer -

What is the illuminance and color of the main light? Shadow Layer - What about ambient light? environmental light layer

☆Auxiliary lighting?
■ Auxiliary light layer

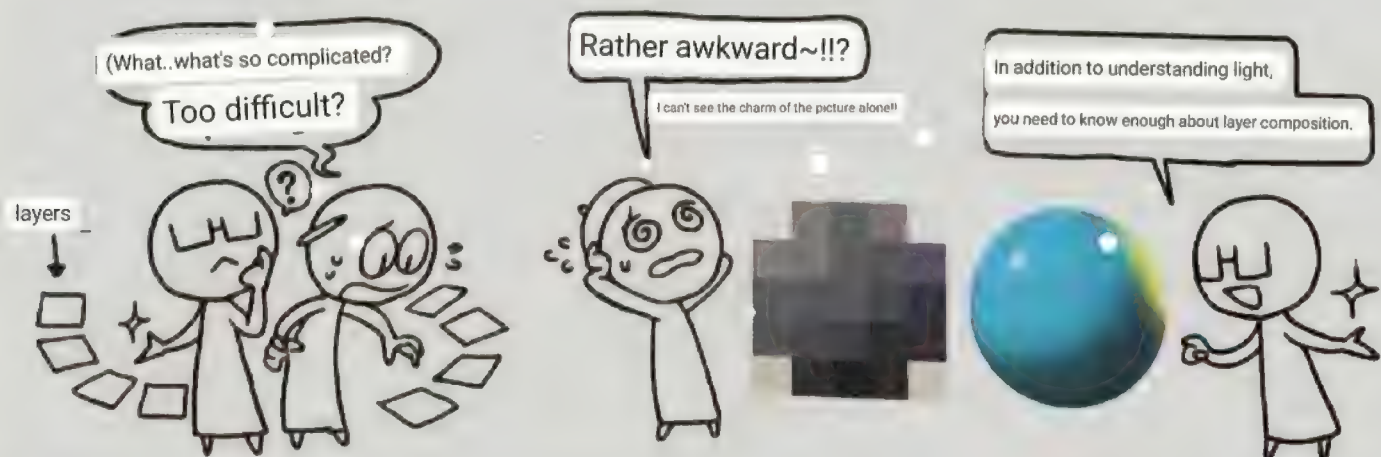I have to adjust each light and shadow as I want!!

ccc..

Rendering is a technology that sets objects and lights in a virtual space and makes the colors appear according to the desired lighting. In general, it is used to draw the appearance of 3D space, and the computer processes the light calculation, so the color is very accurate.

Although it is a bit far from painting-based coloring, by controlling the process and method of making color appear, you can draw a very realistic appearance

(Look..)

The colors of light and shadow are...

LAYER
LAYER
LAYER

Specular

Diffuse

main name

the color of the light

1 Easy to change!!

Rendering manages various light, shadow, and optical phenomena in separate layers, so it is very convenient to modify lighting.

Creating an image by compositing layers is called compositing, and the correct color appears according to the numerical value

(What..what's so complicated?

Too difficult?

layers

Rather awkward~!!?

I can't see the charm of the picture alone!!

In addition to understanding light, you need to know enough about layer composition.

However, managing each layer requires a high level of knowledge about light, and insufficient knowledge soon becomes an unnatural expression. In addition, since it is a color created by the drawing of a computer rather than paint, the originality and unexpected charm that only paintings have may be lacking
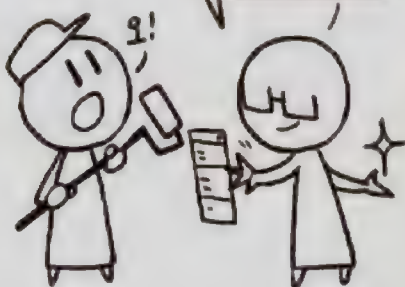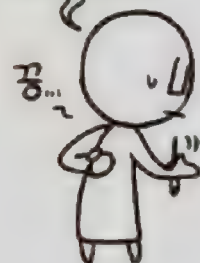
Basic preparation for rendering

In the 3D rendering program, the channels that are synthesized in the image according to the operation of light are called multi (Marpass)

There are many different multi-passes, but let's look at the channels that are suitable for compositing in a painting program like Photoshop

It's optional,

but the more neatly you use it, the better!

0. Line art (standard, multiply, etc.)

•In general, sketches or drawing line art are not used in rendering.

However, you can use lineart depending on your coloring

style. They often act similar to closed shadows.

1. Silhouette Mask

The area where the image to render the layer

will appear. Since there is no light, it appears completely

black. Any layers added after that will appear beyond this silhouette.

2. Subsurface Scattering (Screen)

Synthesizes the surface lightening from the

underside of the surface before rendering the colors that appear on

the surface. The skin appears reddish when exposed to strong light. Shadows

that do not reach light and objects that do not exhibit subsurface scattering

Composite in black so that no change appears.

3. Diffuse reflection (screen)

The color of the diffuse reflection that shows the color of the surface of the object well is synthesized

with the screen. When modifying the object color, be sure to change it on this layer.

→ The thin skin is red.

→ Thion The color is somewhat bluish.

apart from the light

The layer that determines the color of the object!
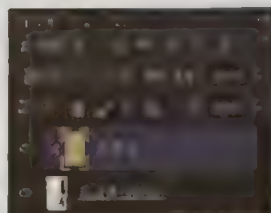
You will find it often...

4. Cast Name Shadow (Multiply)

The parts that are brightened by the light are

white, and the shadows that do not show diffusely reflected colors are combined with

black. We need the shape of the shadow, so we need to use a brush. If you want to

change the color of the main name, make corrections on this layer.

Because it aims for a realistic expression

The cel-watercolor method is somewhat inappropriate for shadow depiction

4-1. Main Name (Screen, Linear Dodge)

Ctrl + J

If the illuminance is stronger, duplicate the layer above

and combine the duplicated layer with screen (weak) or linear dodge (strong)

Adjust the illuminance with layer opacity, curve, or level adjustment

5. Ambient light (screen)

Except for the corners, I color it with the light of the ambient light.

The environment is wide and weak light, so you need to color it with a darker and turbid color

than you think. If you want ambient light to shine on shadows that

the cast name couldn't, clip this layer to the cast name shadow layer to light the shadows
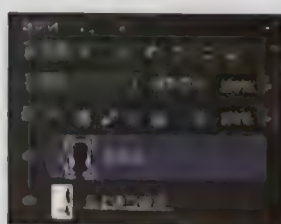
When clipping to the shadow layer,

the ambient light is only applied to the shadow...

The surface volcanic

scattering layer doesn't brighten...

6. Auxiliary Lights (Linear Dodge, Color Dodge)

The part brightened by the auxiliary light, not the main name, is synthesized as a dodge series

Paint the background black and make sure the areas that are not illuminated by light remain unchanged

The intensity of the light is adjusted by curve or level adjustment

<Why use a black background instead of a transparent background...?

샤이

덜

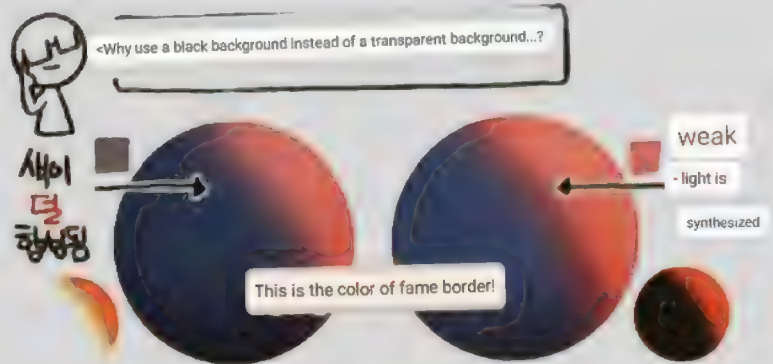힘숨일

weak

- light is

synthesized

This is the color of fame border!

Dodge-based compositing cannot be illuminated with layer opacity, as you need to paint with

a dark color rather than a transparent color to add light with a weaker illuminance
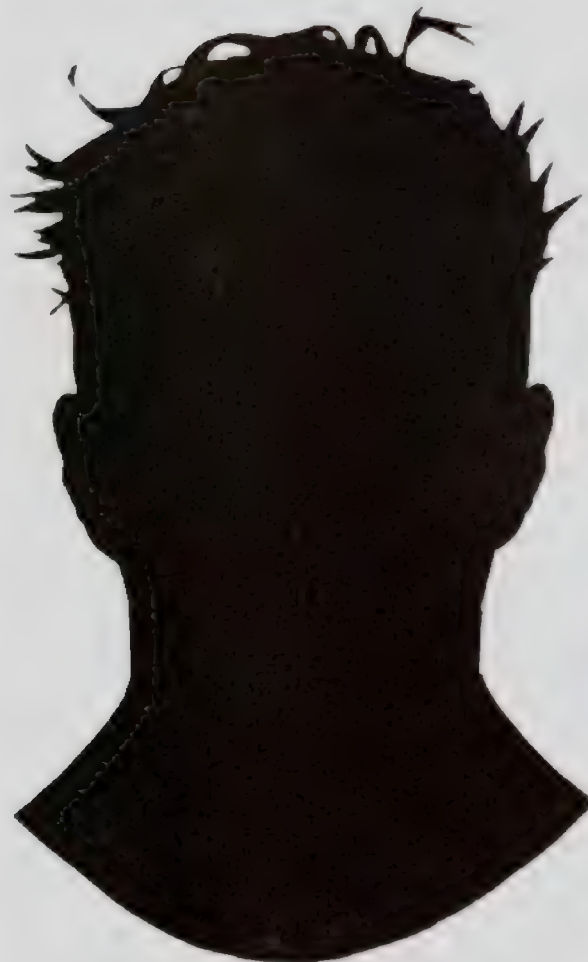
7. Specular (Linear Dodge, Color Dodge)

Color the speculars, which appear as specular reflections of the material, on a black

background and composite them with a Linear Dodge or Color Dodge

Color Dodge is mainly used in lighting composition where the color of light is vivid, and

adjusts the brightness of the specular by the brightness of the color instead of the opacity of the layer

Diffuse reflection (object color)

Specular
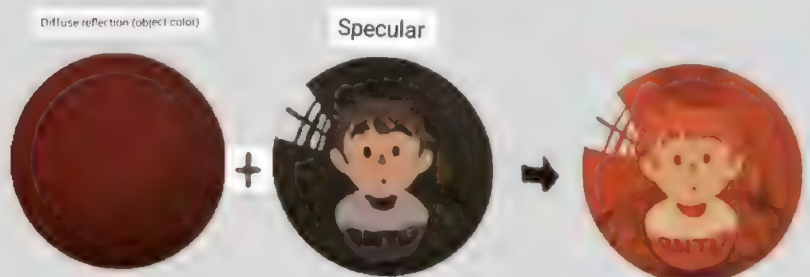
The smooth metallic material reflects the image as it is!

8. Closed Shadow (Multiply)

Darken corners and crevices where no light can shine. A shadow that usually acts similar to a line drawing.

Line drawing (corrected)

closed shadow

The color is decided...

Now let's finish!!

▶ If all layers are placed in order,

color appears according to the operation of each layer.

Detailed parts can be supplemented by coloring directly.

thank you for your effort!

Even if you don't use rendering,

if you have a useful compositing method,

try applying it to the coloring method!

Nani

► Layer arrangement order & adjustment

Photoshop is not a program optimized for compositing, but with good layer control, realistic rendering is possible.
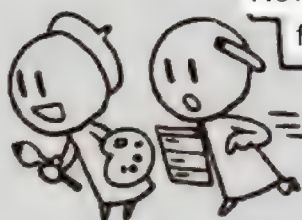

The order of the layers can be found here, and here are some tips for realistic rendering...

-Adjust the specular to match the illuminance and color of the main light.

← ← You can add multiple auxiliary lights.

insufficient lighting color

ex)

← Set the standard of the appropriate illuminance to white, and add it by multiplying the color of the light. Duplicate the layer and screen compositing to increase the illuminance

L The object color can be changed on this layer.

*It is more convenient to use a layer mask.

The process is a bit difficult)

① grouping ((t+G)

② Layer Mask

③ Click Mask   ④ Channel

⑤ Visibility check
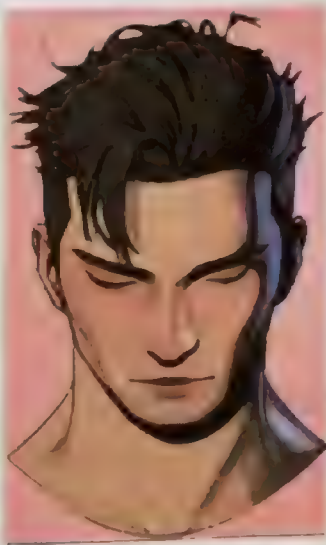
► When this image appears, the masking is over

⑥ Paste the silhouette mask and invert it

((H+V.DI) ...
then refine the mask.

After all design is done.
[Coloring is so easy! -Can be colored with the mouse

Unbelievable!

change object color   lighting change   illumination control

PART 08

tutorial

HERE ON

1_ Basic character coloring

sketch

line drawing

No corrections in

the line drawing process!

closed shadow.

Do not draw

unnecessary lines

good

The sketch of the light

and dark boundary

is as much as necessary for coloring
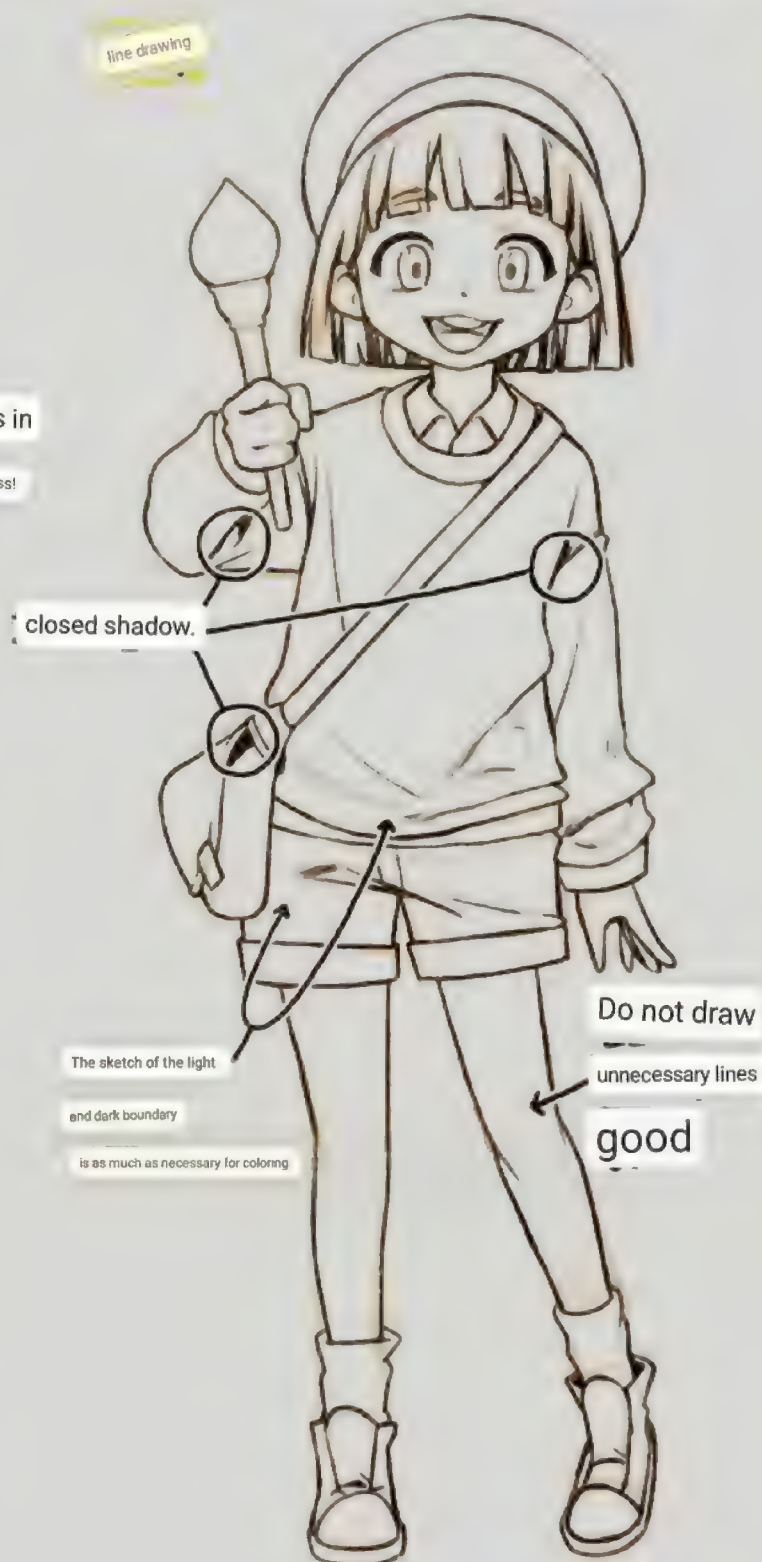
Sketch: Sketch the character you want to draw. I draw carefully so that there is no correction during the line drawing process.

Line drawing: Draws a new line based on the sketch. Draw outlines and closed shadows clearly, and add only as many contrasting borders as necessary

base color

shadow

Lighting direction (slash light)

- Contrast borders appearing

in the list

- Make sure not to be too dark

First, draw with
a simple
border, ·Fit the shape
·Reshape the border.

Shaded areas
are clear

For the layer to be added later,
click on the base
color layer → Clip

Base color: Create a new layer below the line art and paint the base color. Subsequent layers added are clipped to the base color layer and colored.

Shadows: 1. Paint the shape of the shadows sharply on a new layer. Refine the light direction with a sketchy feel. 2 Refine the borders

of the shadows, and use a semi-transparent brush to color the borders of light and dark a little.

shadow synthesis

① Change the shadow

layer to Multiply →

② Transparency lock.

③ Paint with the color

of ambient light (Alt+delete)

shadow tint

When synthesizing a warm color by multiplying it

with a cold color, "Saturation is

greatly reduced, so adjust the color balance ((+H+B)

(It is good to consider the subsurface scattering of the skin in advance)

Conversely, multiplying one color by one color

does not lower the brightness well,

so lower the brightness of the shadow a little (W+U)

① On the base color layer

With the automatic selection tool (w)

select an area,

② It is convenient to adjust

with the shadow layer

Shadow Blend: Multiply the shadow layer and paint it with the color of the environment to make the color of the shadow appear.

Shadow Color Adjustment: Partially corrects the color of the shadow.

It is convenient to select an area on the base color layer and adjust it on the shadow layer. At

this stage, the color of the line art is also painted in the same way (1) and combined with a linear burn

blending

additional shadow

Contrast borders

are blended with the highest priority

Depicts the

curvature inside the shadow

(Continued with Closed Shadow)

The curved shadows on the highlights

need to be painted

brightly to maintain their shape

-Make the shade clearer,

← Smoothly

blend the round shape

It is

recommended to color with a

large brush as much as possible

until the correct shape appears.

It is dangerous to partially

complete

Blending: Colors the gradation at the border of light and dark, and describes the shape in earnest

It blends the light and dark borders with the highest priority, and refines the shadows according to small curves

Additional Shadows: Additional depiction of curves inside shadows and curves in highlights. It is

recommended that the additional shadows in the highlight appear brighter than the existing shadows

- This process takes up most of the total coloring time. Fighting!

detail
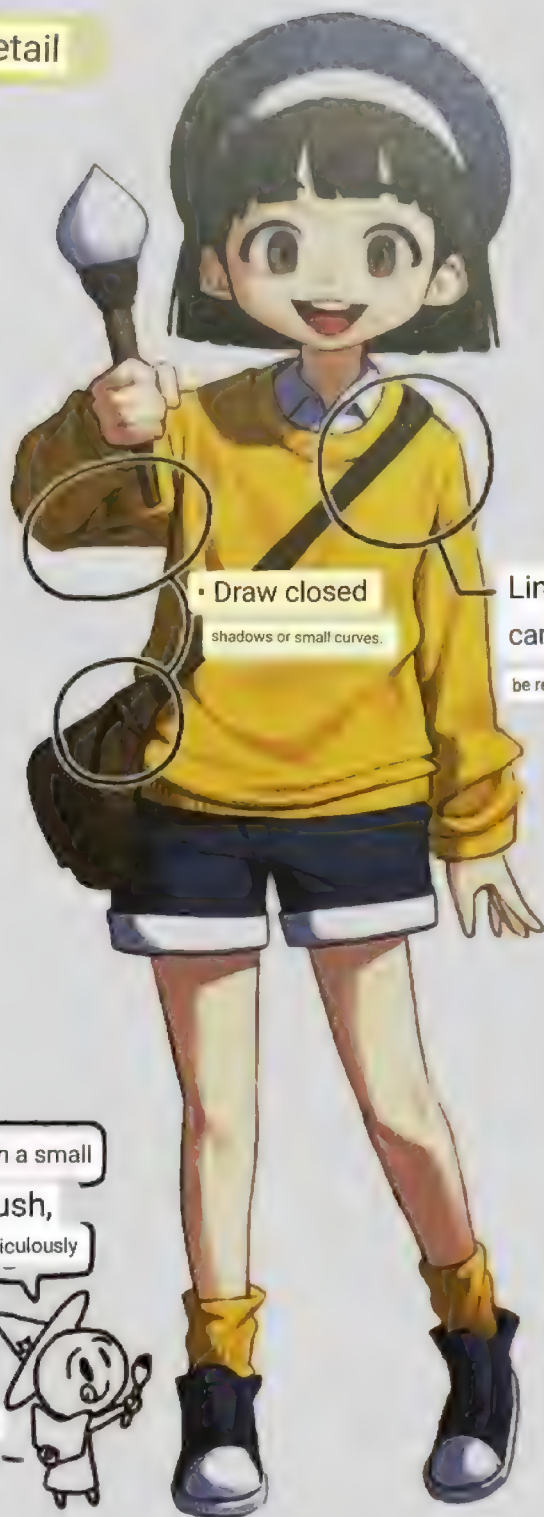
indirect light

· Draw closed
shadows or small curves.

**Line art
can also**
be refined by blending.

The closer the
reflected light
is, the more 'clear'.

**- High-reflectivity materials
are vividly colored**

With a small
brush,
meticulously

second

environmental light

It is illuminating
the shadow as a whole without
a specific direction.

Detail: After describing the overall shape, use a small, sharp brush to refine the detailed curves and shadows. As the brush
becomes smaller, outlines and closed shadows that were drawn with lines can be blended somewhat. The
three-dimensional expression is finished while neatly arranging awkward or rough expressions.

Indirect Lighting: Color with a large brush, starting with wide, weak indirect lighting. (Environmental light, reflected light,
etc.) The texture of the diffuse reflection is very weak, and the smooth texture is painted rather clearly.
At this time, the part not illuminated by indirect light remains dark and is expressed as a closed shadow.

Specular

Finished

additional material

The smooth texture

reflects 1 light specularly.

Except in special cases,

I think

specular inside the shadows.

For pattern

or color

change, use synthesis.

When adding decorations,

draw them yourself

Specular: Colors the specular with a smooth texture vividly.

Materials with rough textures (eg fur, stones, etc.) do not color the specular.

Additional materials: Small patterns or optical phenomena utilize layer compositing

Additional decorations can be drawn to compensate for the lack of depiction

1 pattern (multiply, standard)

Subsurface

Scattering (Overlay)

2_Character Coloring: Light and Materials

sketch + line drawing

The small metal decorations **are colored in the** process of detailing.

Metal describes the specular in the material expression stage, so the base color is darkened

The background **works** independently of the character!

Paint the base color with the color of the ground to which the reflected light will be applied

Sketch+Line Art: Draws line art neatly based on the sketch. Separate the character and the background and draw them. It is convenient to work with very small metal decorations painted black.

Base color: Apply the base color in the same way as before. The background is painted with the most representative object color

Specularly reflective materials, such as metal, are underpainted with a slightly darker color for effectiveness and presentation

shadow

① Paint the part that the main light source does not reach with opaque color.

②Refine the border of the shadow according to the shape.

③ On the round surface, paint the contrast boundary with a semi-transparent brush.

Shadow: Draws a shadow according to the direction of the light. The rounded shape of the light and dark border is also simply colored. In the process of painting the shape of the shadow, it is okay to paint it with any color.

shadow color adjustment

*Lock the shadow layer to transparency.

① The skin color is adjusted so that a slightly red color appears in consideration of subsurface scattering

② The closed shadow is colored with a darker color.

③ Softly paint the area affected by the ground reflector with an airbrush.

Shadow Toning: Paints shadows with colors affected by ambient light and reflected light from the ground, multiplies and composites them. For skin or dark objects, further adjust the color of the shadows to make them appear more natural. The closed shadows in the corners are combined with a darker color. Change the color of the line art and paint it with a linear burn.

Blending ~ Details

Blending~ Detailed Description: Describe in the same way as the basic character coloring order

The three-dimensional expression is finished until the material and light

are expressed. With a small, sharp brush, I carefully color details, closed shadows, and outlines

default background color

lighting direction

(A~y)

Color the shadows brightly
with the color of the ambient light.

Color the shadows with lighting in the
same direction as the character and multiply and
composite. The lower the contrast, the more distant
you feel, so adjust the opacity of the layer as needed.

consider the color of the reflected
light and adjust the color of the shadow by overcoating, etc

Objects other than the
ground are clearly affected by ground reflected light.
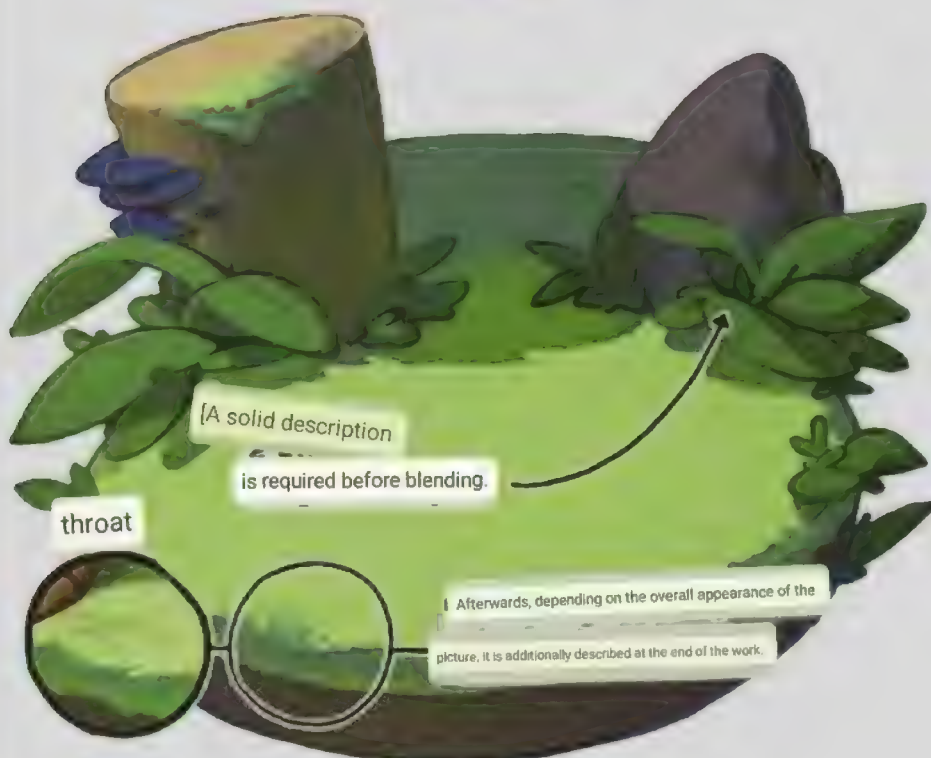
Refine the description as if it were
painted with a face so that the outline does not stand out

The more opaque the brush, the more
convenient it is to color with UN area. I omit
the too detailed description first, and color in the
second half of the work according to the
completeness of the character description.

[A solid description
is required before blending.

throat

Afterwards, depending on the overall appearance of the
picture, it is additionally described at the end of the work.

Materials with relatively low reflectivity are also 'continued to color the specular.

Materials that are highly metallic reflect the colors of adjacent objects well.

•The shadow is brightened by overcoating the cover letter.

•I paint the dark and dark borders darker.

Let's describe in order from wide and weak light to small and clear light!

Subsequently, the reflections of the metal and adjacent objects are also additionally colored

It is recommended that the brush gradually become smaller, depicting in a wide, weak light, small, vivid and in order

While coloring the indirect light shining on the metallic material, the shadows have become brighter overall, so I add a dark color to the contrasting area. After sufficient indirect depiction, I paint with a material with relatively low reflectivity (leather, skin specular).
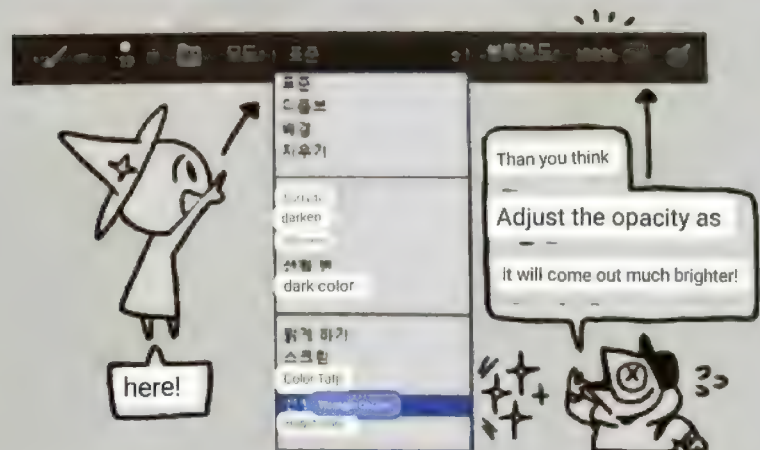
t

When highly reflective materials are adjacent to

each other, the specular appears reflected multiple times

Finally, with the lightest color, we

paint over the vivid specular that appears on the material.

TIP Let's use brush mode!

When drawing a highly reflective material

such as metal or a complex lighting

situation, you can color by

adding light by changing the brush
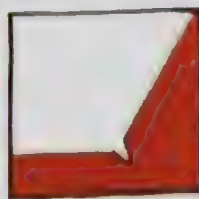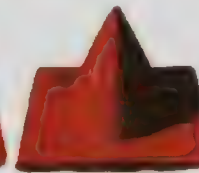
mode to Linear Dodge without blending the colors.

here!

darken

dark color

Color Tdf

Than you think

Adjust the opacity as
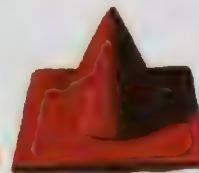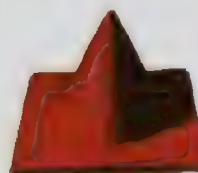
it will come out much brighter!
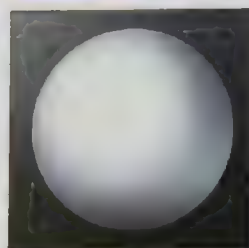
corner expression

right angle

Bevel

To express natural corners,
add specular color to the corners
and bevels of the face.

Fresnel effect <Optional!

No Fresnel effect

Fresnel effect

The outer part of the object is more reflective of light due to the

Fresnel effect, where the more oblique the reflection, the more reflective

After the big depiction is over,

the small depiction that does not require blending

is done by coloring the background!

additional background color

Draw them created by the character. By

creating a new layer, recoloring

it, and compositing it with Darkan, you can

recolor it without overlapping the existing shadow.

When adding the existing

shadow color, if you combine 'Daken'

"The overlapping shadows don't get darker.

·Describe the complex

structure and ·Contrast borders with priority.

Except for the part that is obscured by the character

Add details from the most visible parts.

It is recommended to simplify

the description compared to the character description
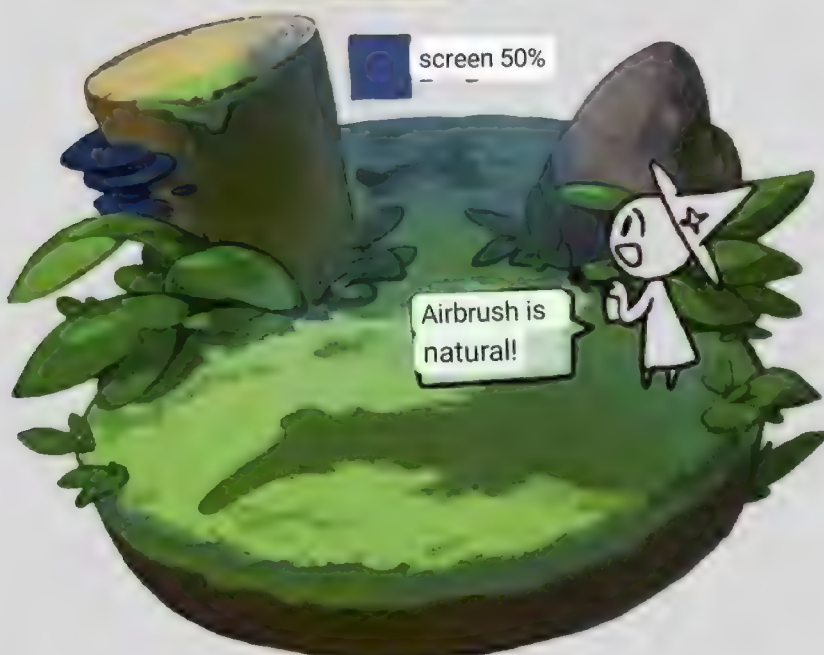
screen 50%

In order to apply the air perspective

to the overlapping part of the character,

the blue color is screen-synthesized

to express a deep sense of space

Airbrush is
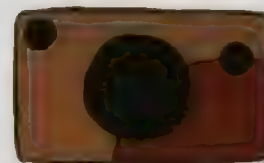natural!

Details - Metal

draw spring.

Specular on the red corner!

Deep grooves or holes in the metal add extra specularity as the cut faces are edged. The specular or specular light around the groove is clearly colored with a small brush.

With black metal trim...

[Paint indirect light as if leaving black

[With specular

[End!!!
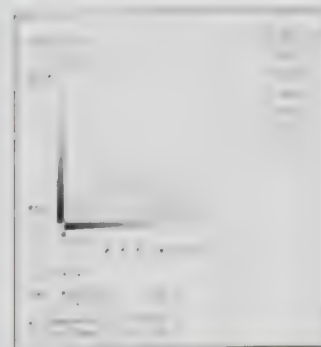
small metal decorations

Since only closed shadows appear,

on a black base

the ambient reflected light and ambient light

Finish with a layer of specular.

3_illustration coloring

For illustrations including backgrounds, it is important that the characters and the lighting in the background match

harmoniously. The coloring method of the character is the same, but it is good to know the process of completing the illustration as a whole

it is also necessary to practice sketching the final atmosphere of the illustration at the beginning of the work.

sketch - base color

From the sketch of the character to the process of color matching, I work without much difference from before
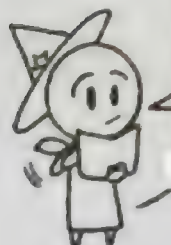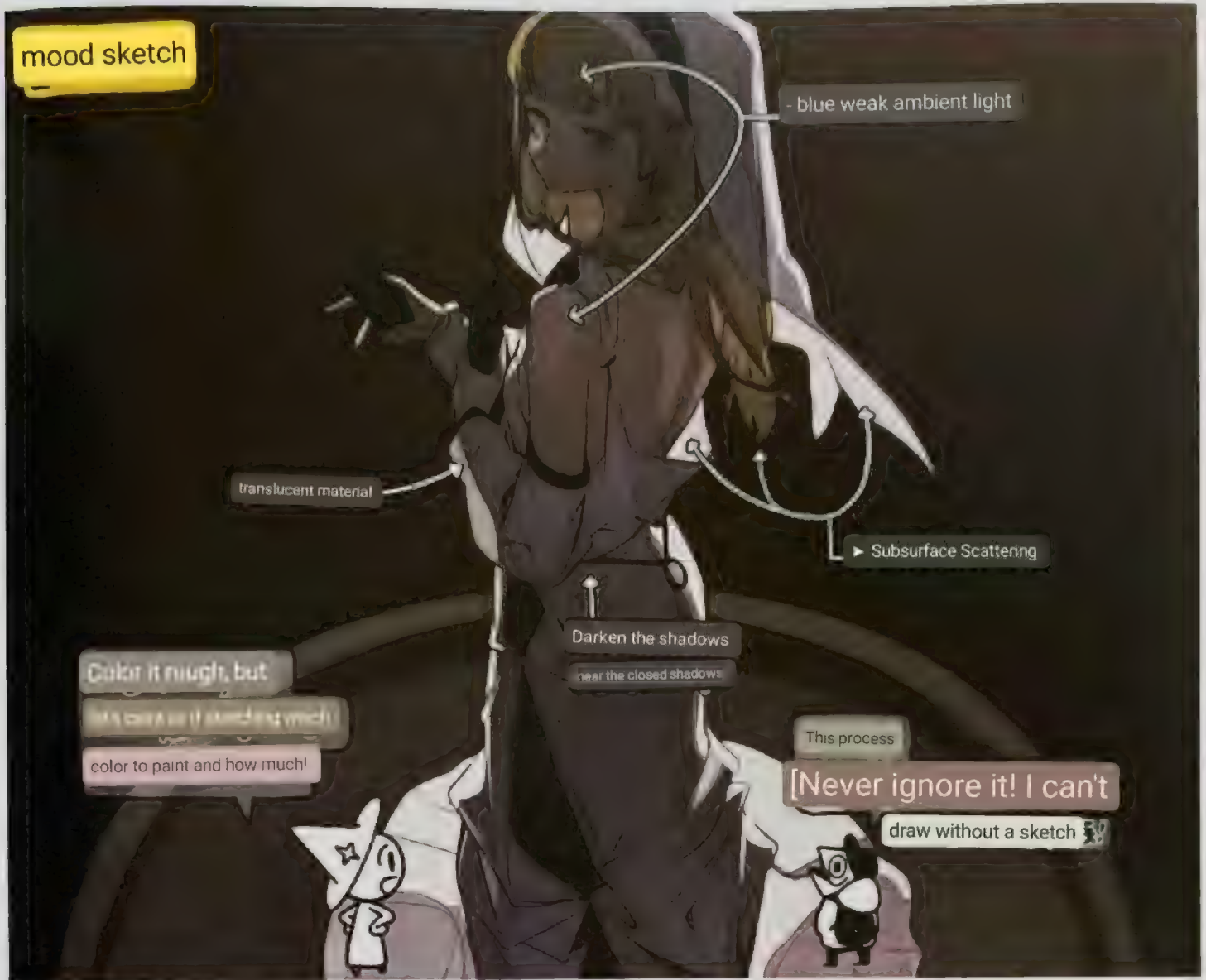
Judging from experience, the sketch of

the border between light and dark is important,

and it would be more efficient to complete the small

decoration later in

the work! .Make the closed shadow darker...

Study your

own way while

coloring!

mood sketch

- blue weak ambient light

translucent material

► Subsurface Scattering

Darken the shadows
near the closed shadows

Color it rough, but

color to paint and how much!

This process
[Never ignore it! I can't
draw without a sketch

Atmosphere sketch I roughly color the atmosphere of the illustration before the full-scale coloring.

Plan what color to use considering the direction and intensity of the light, and the material of the object

It is recommended to omit the detailed description, but to check the proportion of the area to be colored

macroscopically. It is not a process that appears in the illustration to be completed, but do not neglect it

The color of the
shadow is a bit dark and blurry

Check the special
material in advance at this time

Blending: While referring to the atmosphere sketch, I start with the shadows created by the main name

TIP Efficient illustration description order

close to far   big thing small   simple things complicated

It is good to prioritize the description while considering the size of the brush and the coloring method.

Refine the line art and closed shadows · Continue coloring.

A sketch of the light-dark boundary line (feeling like covering the car)

Details are drawn with a small brush.

·Environmental light that is weaker than the main light shines, so the curves inside the shadow should not stand out too much.

The curves and closed shadows inside the shadow are also colored in succession

If the small descriptions expressed at this time stand out too much, the sense of unity will decrease, so

I paint carefully. It's good to aim for even subtle color differences.

Closed Shadow + Reflected Light

A little bit of the reflected

light reflected from the highlights.

-A dark closed shadow is created in the corners

because the light does not shine well.

Detailed closed shadows

are directly colored with a small brush...

-If you want to paint a wide closed

shadow, repaint it with a large transparent

brush or use the Burn and Burn tools.

Closed Shadow + Reflected Light: The closed shadow of the corner and the reflected light from the highlight are overlaid on the shadow area to

refine the color of the shadow and emphasize the three-dimensional effect.

ambient light

In a smooth texture with high reflectivity.

Ambient light is good.

•Apply very lightly with
the texture of diffuse reflection.

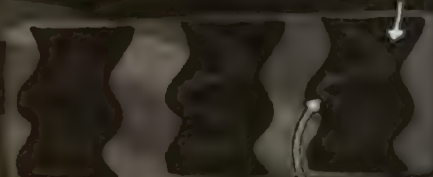The shadows are getting more concrete
and the perfection is getting higher.

In complex structures such as clothes folds,
the most protruding corners are
painted with a bright color.

blending

Color the ambient light inside the shadow while referring to the atmosphere sketch
It is good to express the difference in light reflection depending
on the material. Next, I add another indirect light to the picture to complete it.

detail

Small decorations are added by hand-painting with a small brush.

It is convenient to use layer composition for flat decorations such as patterns.

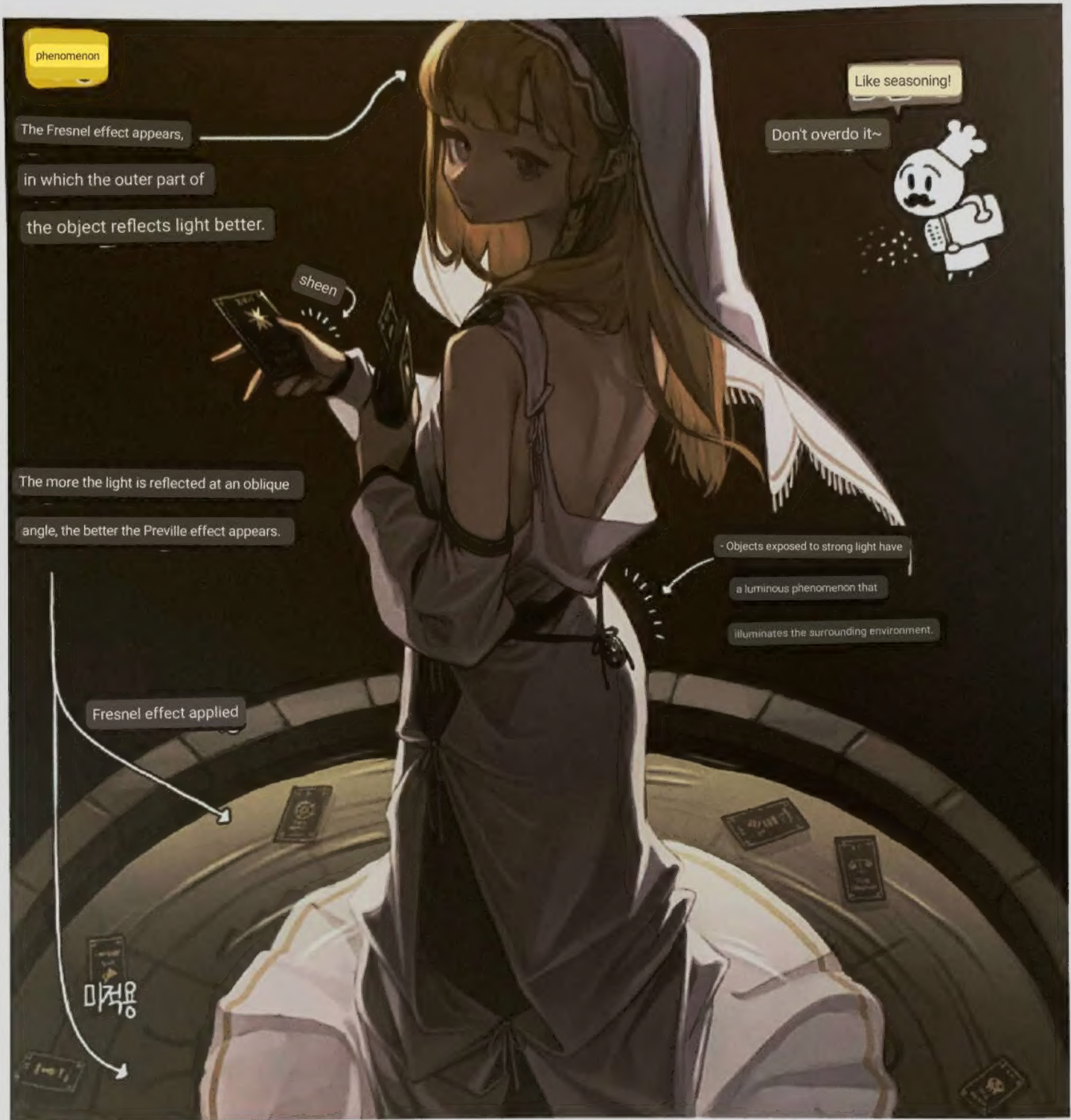Detail: Adds small decorations, patterns, etc. that do not require blending. You can use a small and clear brush, and use the layer compositing function.

The big brush now stops...

Colored according to the mood sketch!!

Tidy up with a small brush!

·Let's improve the completeness of the background together!

As we refine the existing depictions and additional decorations, we color the background as well

Describing the setting balances the character's completeness and balance

It's a good idea to check from time to time to see if things went as planned in the mood sketch

phenomenon

The Fresnel effect appears,

in which the outer part of

the object reflects light better.

sheen

The more the light is reflected at an oblique

angle, the better the Preville effect appears.

Fresnel effect applied

Like seasoning!

Don't overdo it~

- Objects exposed to strong light have

a luminous phenomenon that

illuminates the surrounding environment.

Phenomenon: Adds a phenomenon that appears due to the interaction of light and material.

Excessive description of the phenomenon may mask the descriptions expressed with direct color, so be careful.

Even if a specific phenomenon does not appear, we sometimes add a suitable optical phenomenon for the atmosphere of the illustration.
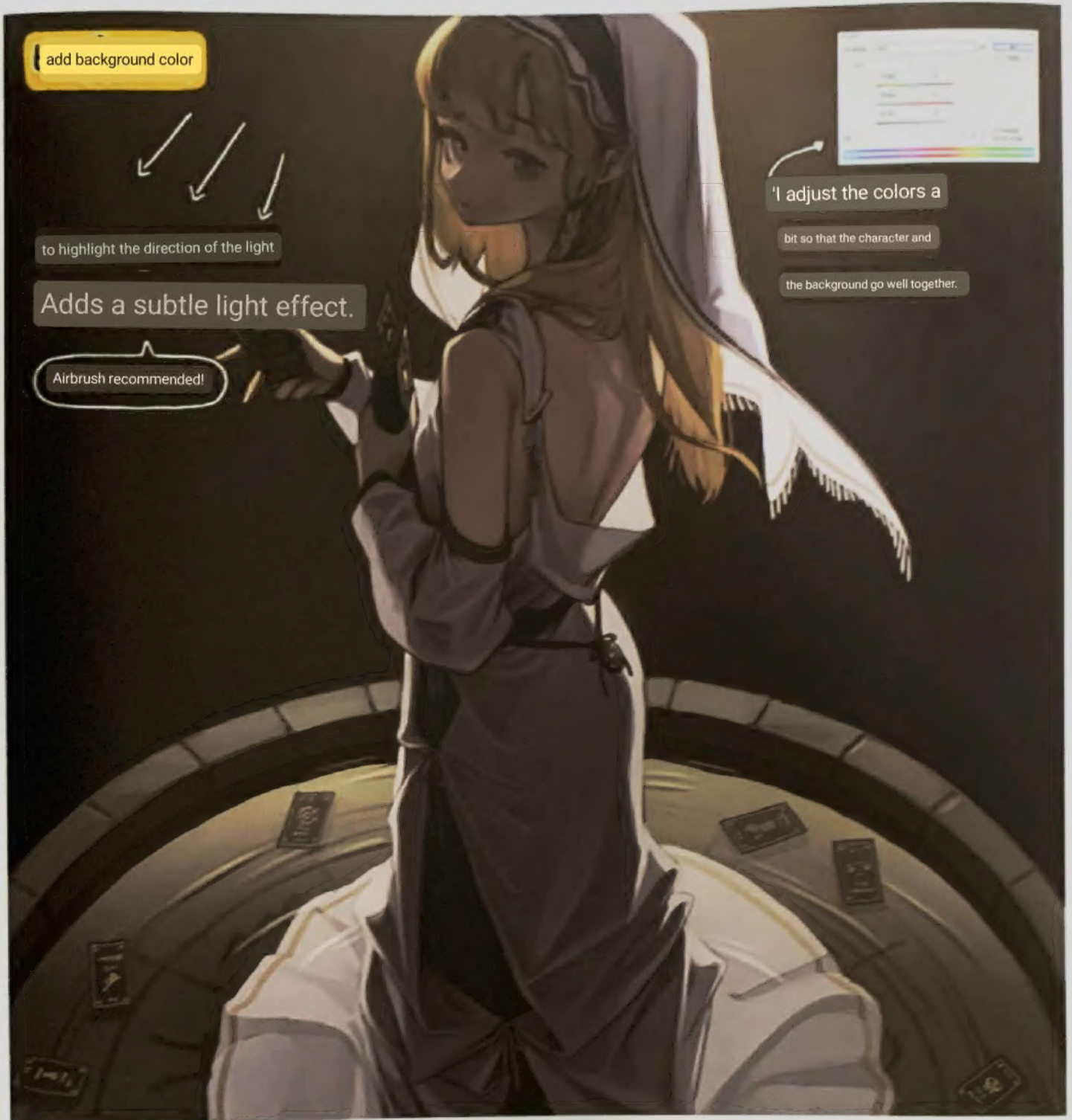
Additional background coloring: The background is additionally described so that the background and the character match each other.

Rather than depicting additional objects in the background, it is better to express the lighting direction or perspective.

complete

color correction

Curve 1 (GH+M)

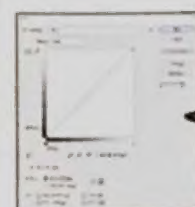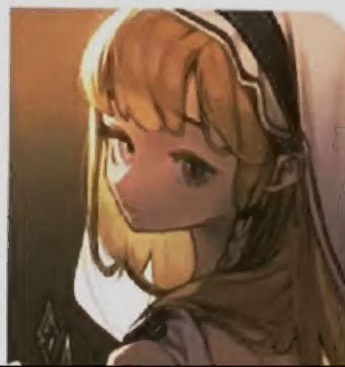Correction and completion: Check the atmosphere of the illustration and correct the color and finish.
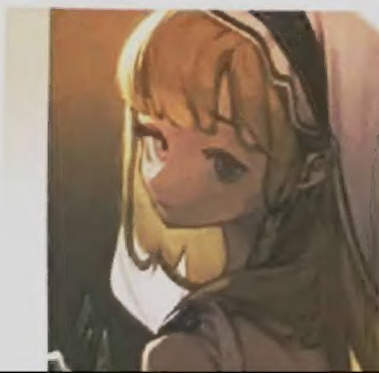
[Adjust the color with overlay synthesis and...

Use the V airbrush!

Adjust the brightness with curves!